Devoted to
TEXTILE
CHEMISTRY
BLEACHING
DYEING
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AMERICAN DYESTUFF REPORTER

MAY 29

MAY 19, 1947
VOLUME 36, No. 10

NEW—

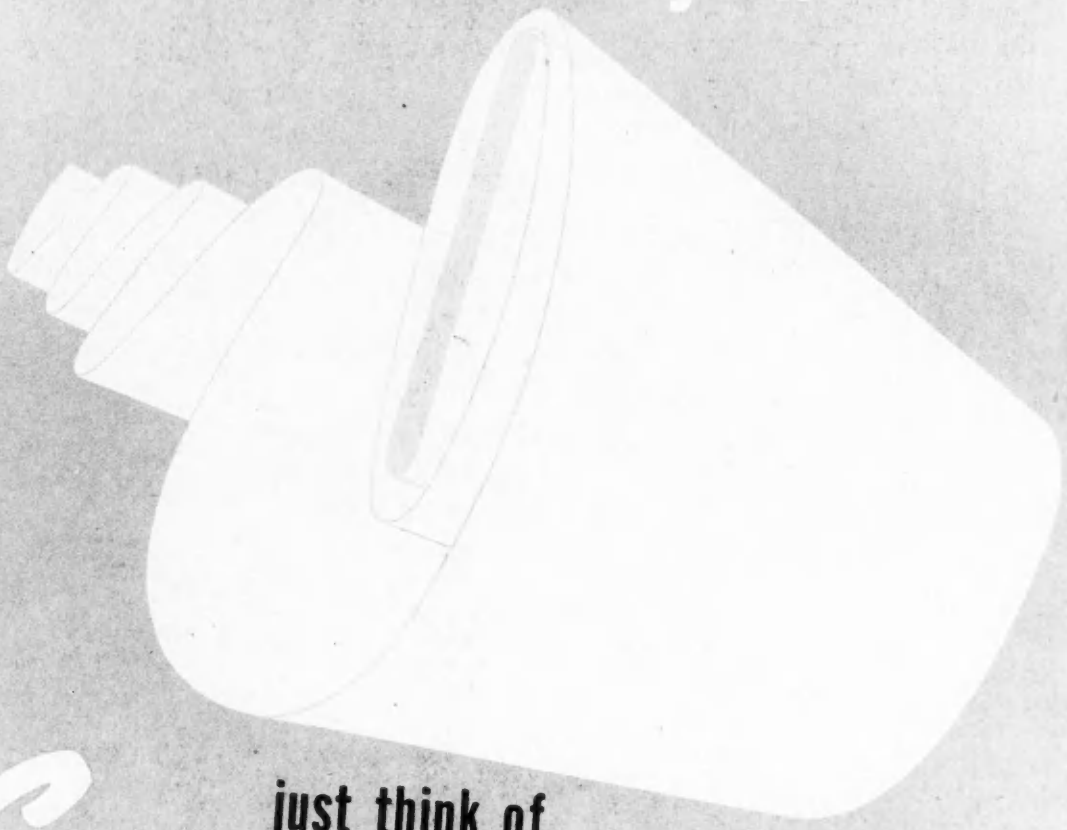
Chromacyl
REG. U. S. PAT. OFF.
Pink B

An addition to Du Pont's line of "Chromacyl" colors . . . particularly well suited for application to woolens and worsteds, either in self shades or in combination for suitings, bathing suits, sportswear, and rugs. Extremely level dyeing, "Chromacyl" Pink B possesses very good fastness to dry cleaning and perspiration . . . good resistance to washing and light. E. I. du Pont de Nemours & Co. (Inc.), Dyestuffs Division, Wilmington 98, Delaware.

Du Pont Dyestuffs
BETTER THINGS FOR BETTER LIVING
...THROUGH CHEMISTRY
DU PONT
REG. U. S. PAT. OFF.

OFFICIAL PUBLICATION
of the
PROCEEDINGS
AMERICAN ASSOCIATION
OF TEXTILE CHEMISTS
AND COLORISTS

whenever you think of nylon



just think of Supernylite

fast dyes for nylon

light fastness medium shades, 40 to 300 hours

wash fastness 140° F. to 180° F.

Dye Fast Unions on Nylon and Wool.
Dye Fast Unions on Nylon and Rayon or Cotton in combination with SUPER-LITEFAST direct dyes.

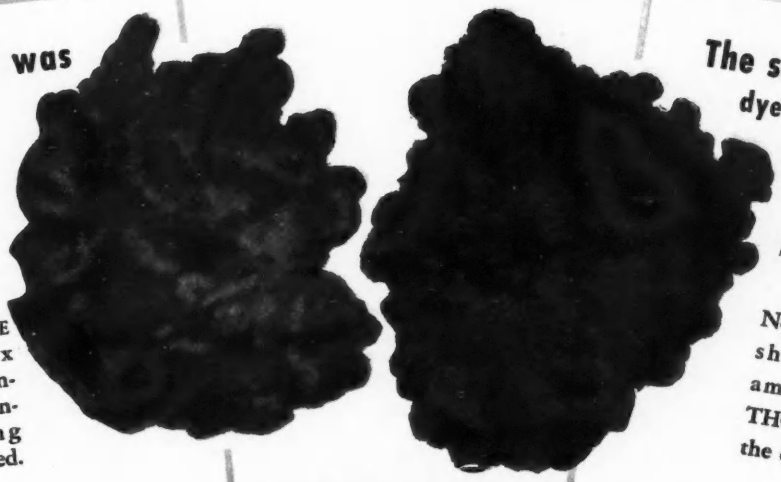
Extremely level dying in all percentages, for pastels and heavy shades on piece goods, yarns, etc.

ALTHOUSE
Chemical Company
READING · PA.

TIPPY WOOL ?

This wool was dyed in the ordinary way

An ACID BLUE (Color Index No. 208) considered an uneven dyeing color, was used.



The same wool— dyed with the same color, but with the aid of ANTHOMINE

Note the uniform shade. A small amount of ANTHOMINE made the difference.

TRY ANTHOMINE !

(PATENT APPLIED FOR)

TO ELIMINATE UNEVEN DYEINGS

- . . . QUICKER AND BETTER EXHAUSTION OF THE DYEBATH
- . . . A SOFTER, MORE PLEASING "HAND"
- . . . SUBSTANTIAL INCREASE IN COLOR YIELD
- . . . NO SACRIFICE OF BRIGHTNESS OR FASTNESS
- . . . PROCESSING TIME REDUCED

Although it has only recently been released for general sale, ANTHOMINE has been used and tested by many mills for more than a year. Colors and wool with tendencies toward uneven and tippy dyeing were especially selected for testing.

The results of actual mill use of ANTHOMINE in dyeing stock, yarn, or piece goods confirmed the hundreds of tests made in our laboratories.

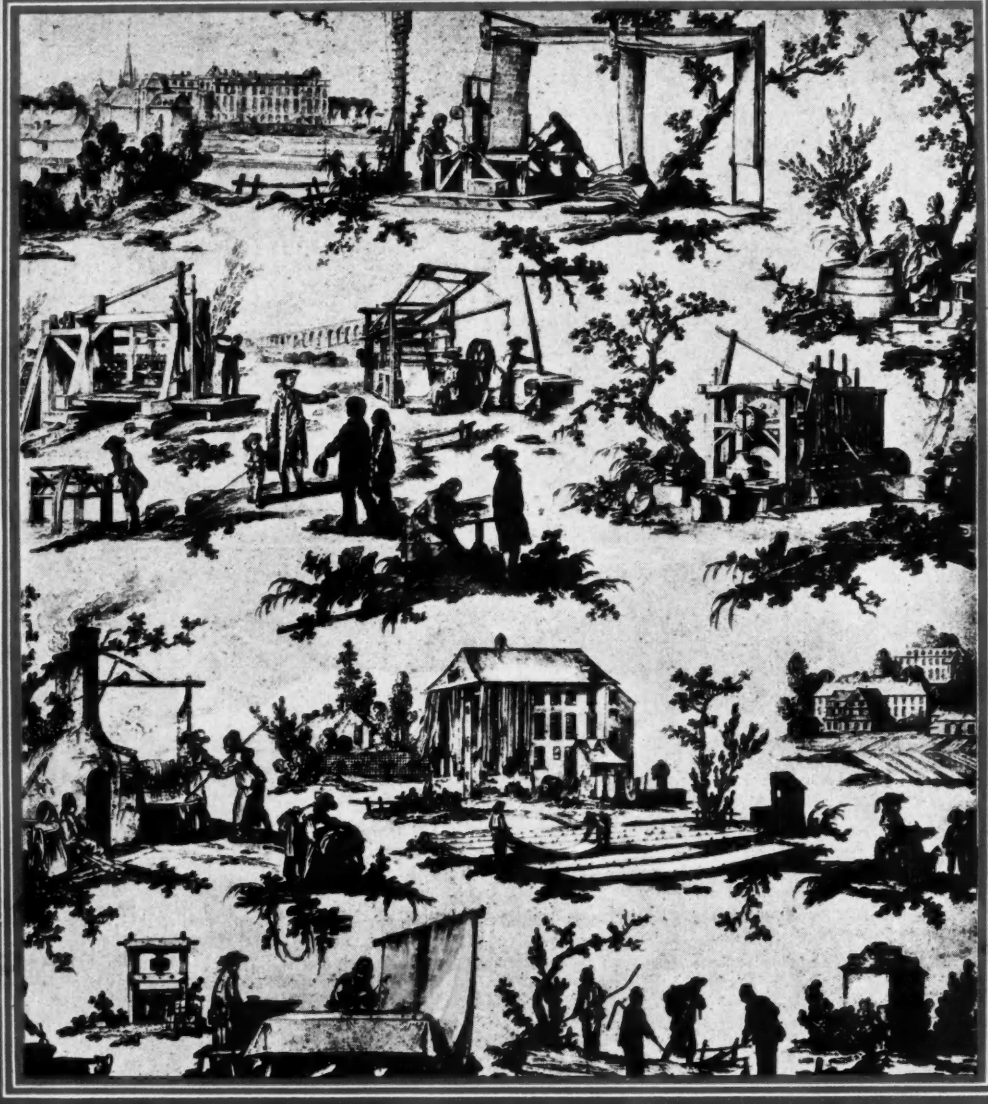
Thus, ANTHOMINE is now offered to the trade as a tried and tested solution to the tippy wool dyeing problem with an assurance born of complete success in dyehouse.

Write for Technical Service Bulletin No. 203.100.1

Arkansas Co. INC.

Manufacturers of Industrial Chemicals for Over 40 Years

NEWARK, NEW JERSEY



Les Travaux de la Manufacture.
Printed fabric designed by J. B. Huet circa 1783 for Manufacture Royale de S.-D. Oberkampf, Jouy, France, showing phases in the manufacture of their printed cottons.
Courtesy Columbia University Library

RAPIDASE

FOR MODERN DESIZING

WALLERSTEIN COMPANY, INC. 180 Madison Ave., New York 16, N. Y.

American Dyestuff Reporter, Vol. 36, No. 10, May 19, 1947. Published every other Monday. Copyright, 1947, by Howes Publishing Co., One Madison Ave., New York 10, N. Y. Domestic subscription, $5.00; Canadian, $6.00; Foreign, $6.00. Entered as second-class matter, Nov. 6, 1919, at the New York, N. Y., Post Office, under the act of March 3, 1879.

MORE AND MORE DYESTUFF MANUFACTURERS ARE USING

MARASPERSE*

a group of exceptional dispersing agents

Whether you're producing acetate, pigment, or vat-colors, it will pay you to investigate MARASPERSE. Derived from the lignin component of wood, these dispersants are highly purified, non-hygroscopic, non-fermenting, free-flowing powders and free of reducing sugars.

MARASPERSE C
is calcium lignosulfonate with a pH of 7 (3% solution)

MARASPERSE N
is sodium lignosulfonate with a pH of 7 (3% solution)

MARASPERSE CB
is a partially desulfonated sodium lignosulfonate with a pH of 9 (3% solution)

We fully appreciate the specific nature of each problem involving dispersants and consequent difficulty in making general recommendations. In this connection our technical service is available for consultation and cooperative effort in the solution of your problem.

Samples and supplementary literature will be supplied on request.

MARATHON CORPORATION
Chemical Division
ROTHSCHILD • WISCONSIN

*Trade Mark Reg.

ng Co., One
, 1919, at the

MAYBE YOU'RE NOT INTERESTED IN PINEAPPLE JUICE

. . . but

you may have the same problems of contamination, corrosion, suspended solids and mechanical remote control which prompted the engineers of The Dorr Company to select Grinnell-Saunders Diaphragm Valves for the Dorrco De-Ionization System for the new plant of the Hawaiian Pineapple Co. in Honolulu.

YOU, too, may find your answer to valve troubles due to corrosion, contamination or suspended solids in

GRINNELL-SAUNDERS DIAPHRAGM VALVES

ISOLATED WORKING PARTS

The flexible diaphragm isolates working parts of the valve from the fluid, preventing contamination or corrosion.

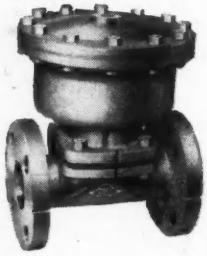
CORROSION-PROOF LININGS

A selection of diaphragm materials and also body linings of glass, porcelain, lead, rubber or synthetics to suit service requirements.

STREAMLINED FLOW . . . POSITIVE CLOSURE

Streamlined passage without pockets minimizes friction. Large area of contact of the diaphragm, plus diaphragm resilience, permit positive closure even when solids are trapped.

Standard valve available in screwed and flanged types.



Neoprene-lined, piston-operated valve specified by The Dorr Company for mechanical remote control.

Write for catalog—Grinnell-Saunders Diaphragm Valves

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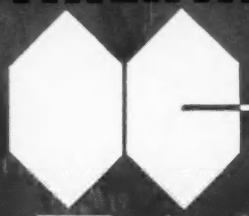
WHENEVER PIPING IS INVOLVED

SHARPLES-CONTINENTAL CORP.



NEOLENES

of the 200 SERIES

NEOLENE 210 Monononylnaphthalene
NEOLENE 220 Dinonylnaphthalene

INTERMEDIATES FOR ANIONIC SURFACE ACTIVE COMPOUNDS

When sulfonated, Neolene 210 yields an excellent surface active compound, valuable as a wetting and cleansing agent.

REPRESENTATIVE SURFACE ACTIVE PROPERTIES OF THE SULFONATE OF NEOLENE 210 (40% ACTIVE):

% Concentration	Surface Tension—distilled H_2O at 25°C. (dynes/cm.)	Interfacial Tension Water against mineral oil (dynes/cm.)	Sinking Time in distilled H_2O at 25°C. (seconds)
0.00	72.0	48.1	—
0.001	66.4	36.4	—
0.010	41.7	12.9	—
0.100	32.1	0.9	78
0.200	—	—	17
0.300	—	—	7
0.400	—	—	—
1.000	29.6	0.7	—

The Sharples-Continental NEOLENES (not the sulfonates) are sold exclusively by SHARPLES CHEMICALS Inc. For further information and samples, please address

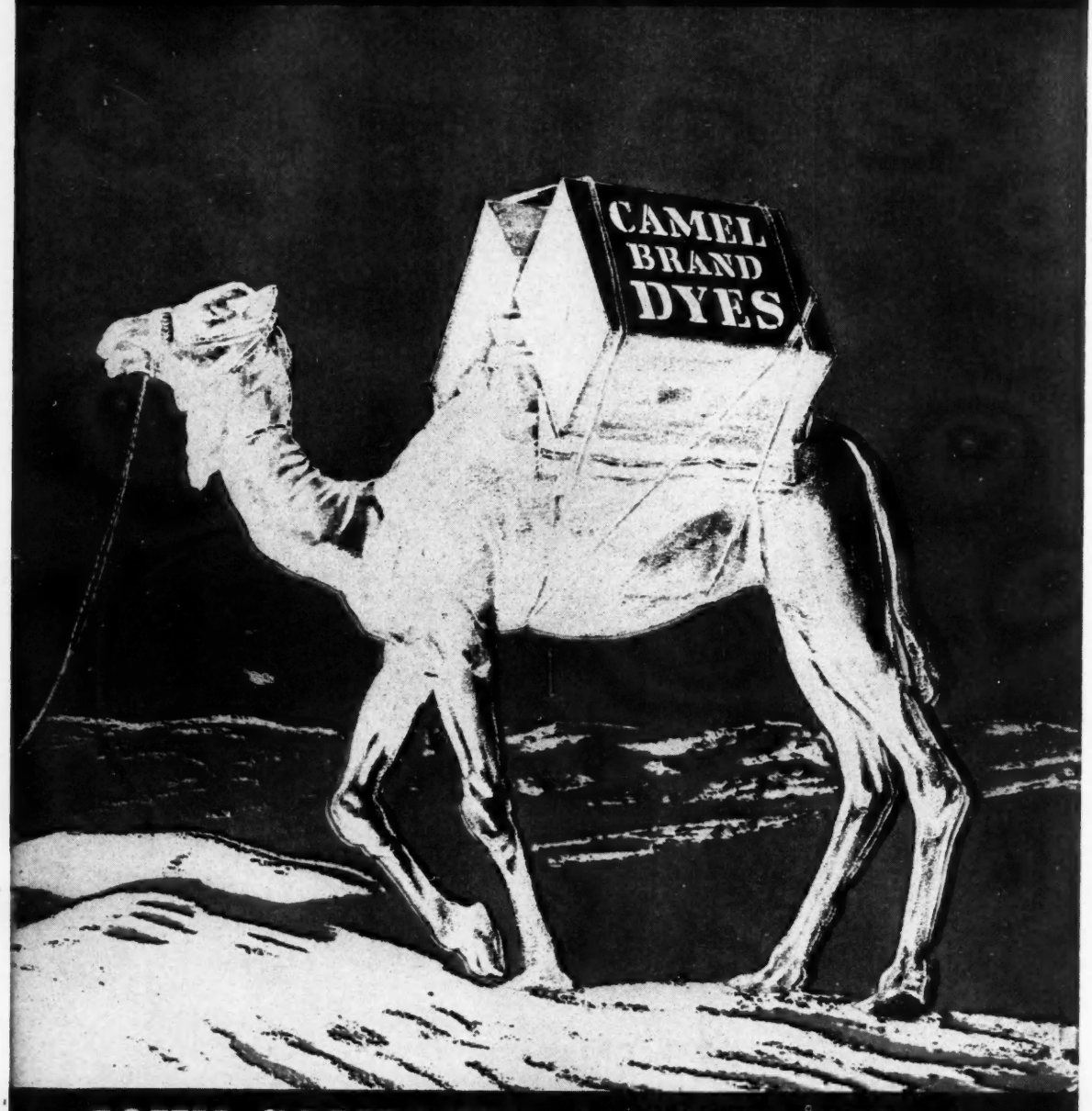
SHARPLES TRADE MARK CHEMICALS

SHARPLES CHEMICALS INC.

PHILADELPHIA CHICAGO NEW YORK

QUALITY DYESTUFFS

SINCE 1878



JOHN CAMPBELL & COMPANY, INC.

75 HUDSON STREET • NEW YORK CITY

TELEPHONE: BArclay 7-6228-6229

PHILADELPHIA: BROAD AND SPRING GARDEN STS.

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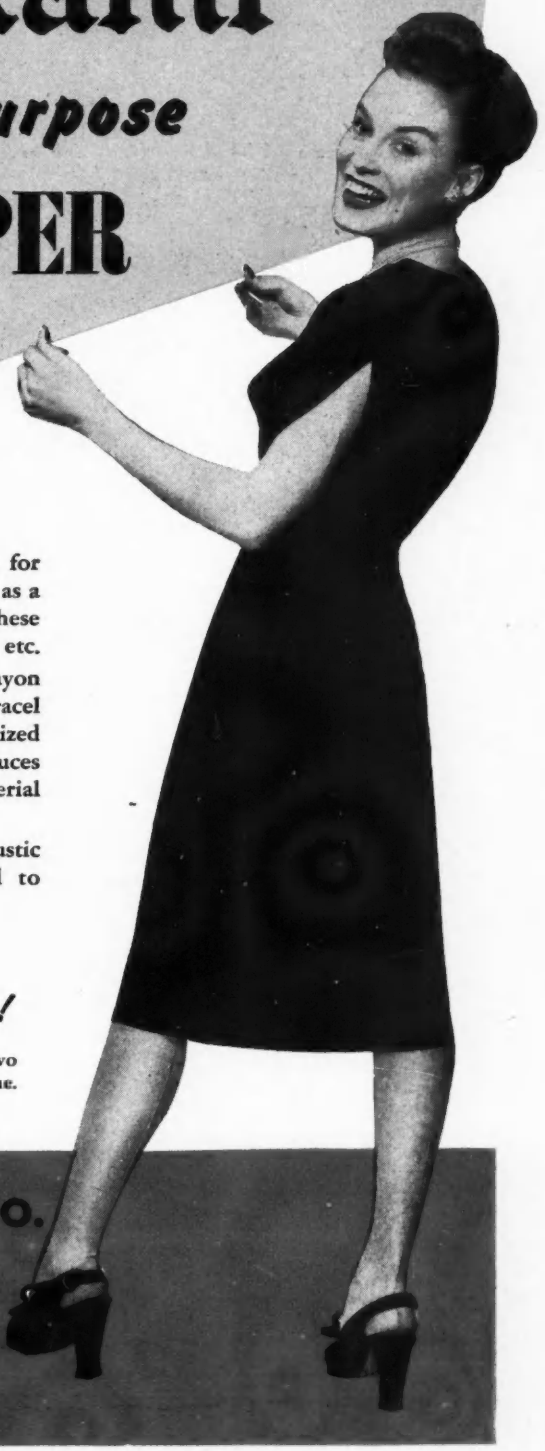
Hydroxanil

the Multi-Purpose

DEVELOPER



HYDROXANIL is not only excellent for acetate and nylon blacks but also finds extensive use as a developer for rayon and cotton developed colors. These include Diazo Black BH, Diazo Green 3G, Primuline, etc.

Wash-fast developed blacks on acetate and rayon combination materials may be obtained by using Maracel Developed Black A and Diazo Black BH diazotized and developed with Hydroxanil. This method produces greater wash-fastness than when this type of material is dyed with acetate and direct blacks.

Hydroxanil is simple to use—requires no caustic soda. Simply stir into boiling water and add to developing bath.

...Develops Complete in 30 Minutes!

MARCO PRODUCTS

No excess rinsing or soaping required! Two batches dyed in the time usually required for one.

MAHER COLOR & CHEMICAL CO.

FACTORIES AND LABORATORIES

355 West Ontario Street, Chicago 10, Ill.

2327 East Eighth Street, Los Angeles 21, Calif.

For Unusually Smooth Permanent Hands

ONYXSAN LG
The Newest Member of the Onyxsan family of Cation-Active Softening Agents

ONYXSAN LG has all the outstanding properties which have made the Onyxsan Series of cation-active softening agents so valuable, plus the ability to provide unusually attractive, smooth, drapable hands. It is further distinguished by the exceptional resistance to washing exhibited by the finishes it gives. On cotton, rayon and bemberg this finish is permanent.

Like the other Onyxsans, the action of Onyxsan LG is to effect a characteristic change *within* the yarn itself, instead of applying a superficial surface effect such as obtained by lubricants.

If you are interested in obtaining a wide variety of durable hands on your materials, the economy and versatility of Onyxsan LG call for investigation and trial.

- Substantive to all textile fibers.
- Small quantities produce its characteristic effects.
- Stable to hard water, chlorides, sulphates and organic acids.
- Easy to apply in the jig, pad, quetsch, dye beck, etc.
- No odor, rancidity, stiffness or mark-off.

Onyx Oil & Chemical Company
JERSEY CITY 2, N. J.

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onyx **CHEMICALS FOR DYEING AND FINISHING**

igepon

first and foremost
synthetic detergent

- eliminates hard water problems
- shortens production time • cuts costs
- assures highest quality in fabrics

may we advise you how igepon can solve your mill problem

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TEXTILE CHEMICALS

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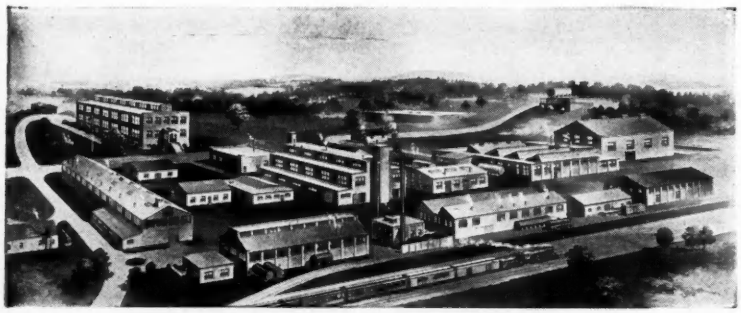
FOR

WOOL — COTTON — RAYON — ACETATE

AND MIXED FIBERS



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Dyes for coatings, suitings and custom shoe leathers, of course! But what of rouge, lipstick, face powder and nail enamel?

Whatever you wear, use or see it's likely to be colored with National Aniline dyes. For National alone makes every class of aniline dye and color...has had longer and broader application experience than any other American producer.

Specify National Aniline Technical Service and Dyes for assured results.

WHEREVER COLOR IS USED

National Aniline

DIVISION OF

ALLIED CHEMICAL & DYE CORPORATION

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NOW, FOR YOUR CONVENIENCE

...The Concentrations of Becco Hydrogen Peroxide are given

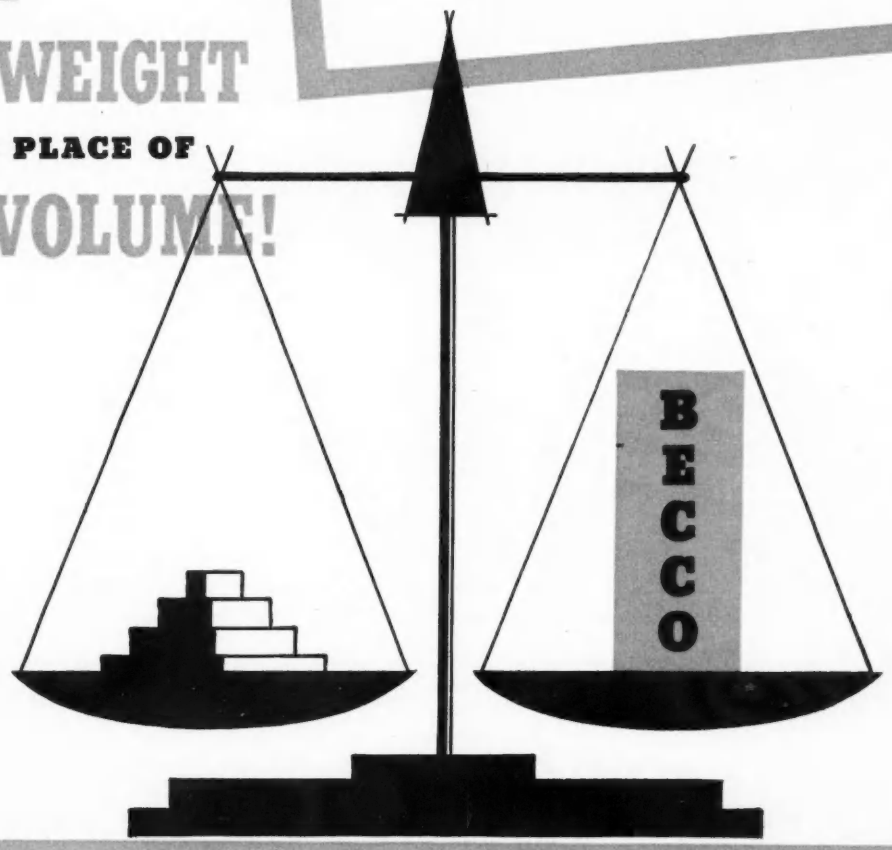
BY WEIGHT

IN PLACE OF

BY VOLUME!

FOR the convenience of our textile industry customers, the concentrations of Becco Hydrogen Peroxides are now classified *by weight* rather than *volume!* We are sure this will meet with the approval of the chemists in the textile industry. For example, Becco will supply industry with 27½%, 30%, 35%, 50% and 90% Hydrogen Peroxide, *by weight*, a variety sufficient to meet any requirement.

And remember that Becco's engineers and chemists are qualified to give valuable advice on bleaching as a result of many years of specialized bleaching experience. Why not ask them to advise you what system is most suitable for processing your goods, whether they be cotton, wool, knit goods, rayon or other natural and synthetic fibres.



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AGENTS FOR BUFFALO ELECTRO-CHEMICAL COMPANY, INC.

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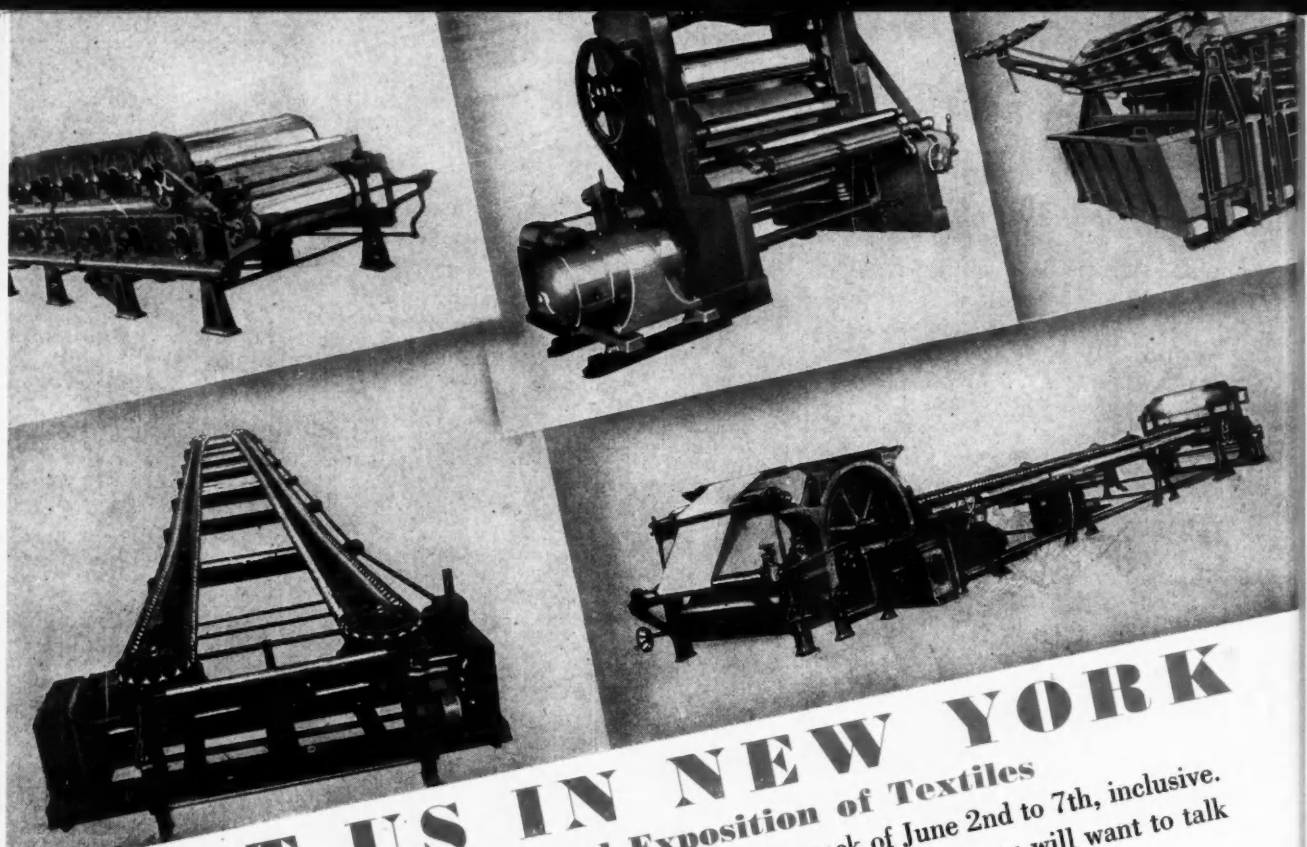


MEET US IN NEW YORK

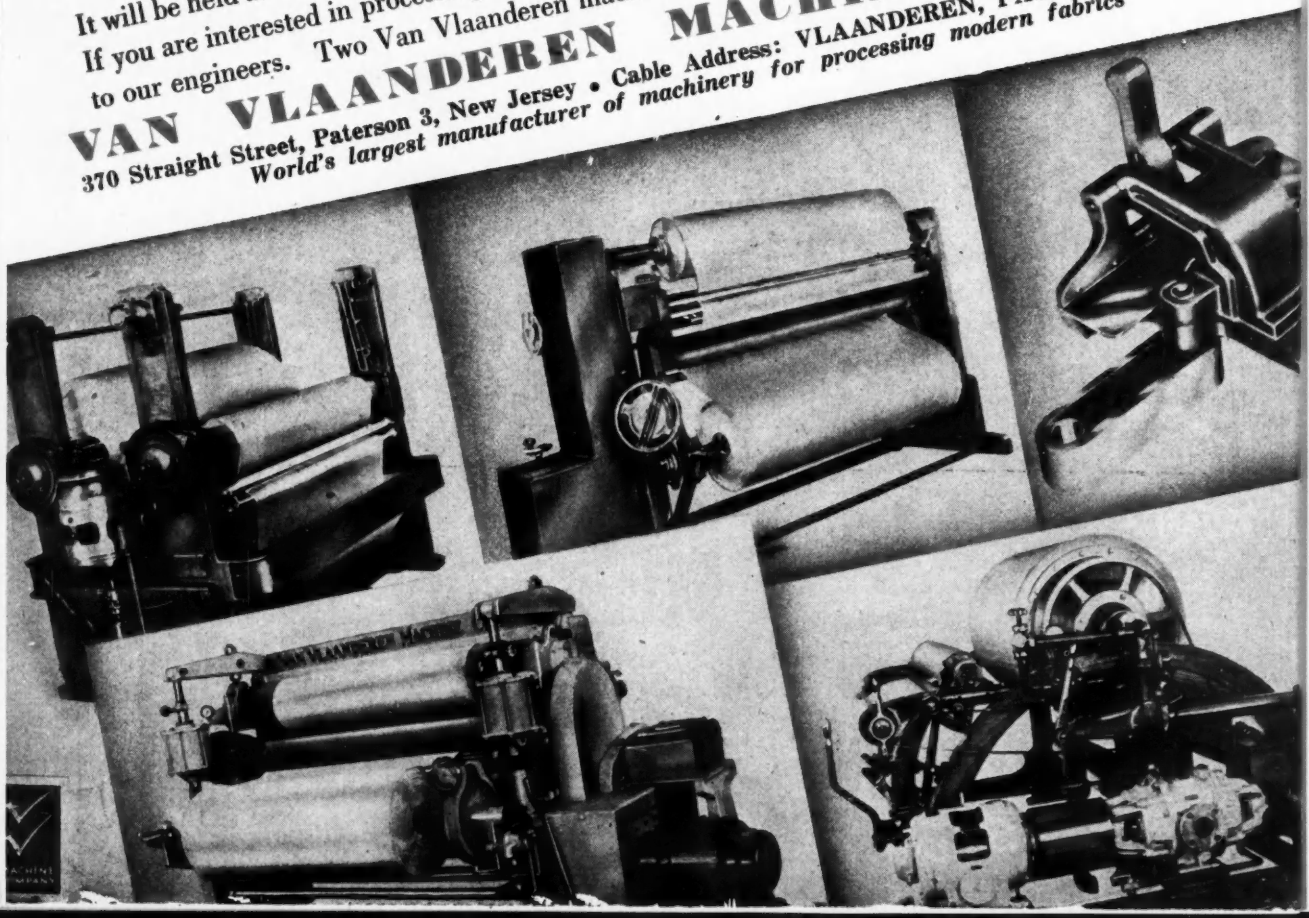
at the International Exposition of Textiles

It will be held at Grand Central Palace, New York, during the week of June 2nd to 7th, inclusive. If you are interested in processing and finishing equipment for broad goods you will want to talk to our engineers. Two Van Vlaanderen machines will be on display.

VAN VLAANDEREN MACHINE COMPANY

370 Straight Street, Paterson 3, New Jersey • Cable Address: VLAANDEREN, PATERSONNJ, U. S. A.

World's largest manufacturer of machinery for processing modern fabrics



What a product!

REPCOL*

The New ALL-PURPOSE Synthetic Detergent

MOST EFFICIENT + MOST ECONOMICAL

All we ask you to do is to test this new detergent against any other on the market for stability in hard water, wetting-out dispersing, foaming, etc. and then you will see performance that will make you say "what a Product."

*REG. U. S. PAT. OFF.

Repcol is the most efficient product on the market — yet it costs you less.

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Lyndhurst • New Jersey

Manufacturers of PERMA-CIDE, the approved, outstanding, mildew-proofing agent

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NYLON CONING OIL 702

A COMPLETELY SAPONIFIABLE SYNTHETIC ESTER

- **Uniform low viscosity insures even take-up**
- **Promotes clear, uniform stitch**
- **Prevents stripping**
- **Does not stain**
- **Easily removed in scouring**

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YOUR ASSURANCE OF EXCELLENCE

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A colorful jubilee of gay, crisply-clear prints and rich, glowing pastels go hand-in-hand with the golden-red festival of fall. Brilliant, enduring colors that take the center of the stage are always assured with Keltex, the modern algin thickening agent.

In machine and screen printing Keltex offers exact printing paste viscosity, perfect penetration — true, even color values. It is highly adaptable to the pad pigment method of vat dyeing, effectively controls pigment migration. Keltex is easy to apply — and only a light wash is required for removal.

Keltex is a product of nature, free of impurities and rigidly processed to assure consistently uniform results. You'll get perfect prints and pastels — with surprising economy. Just drop us a line for complete information.

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ALGIN
PRODUCT

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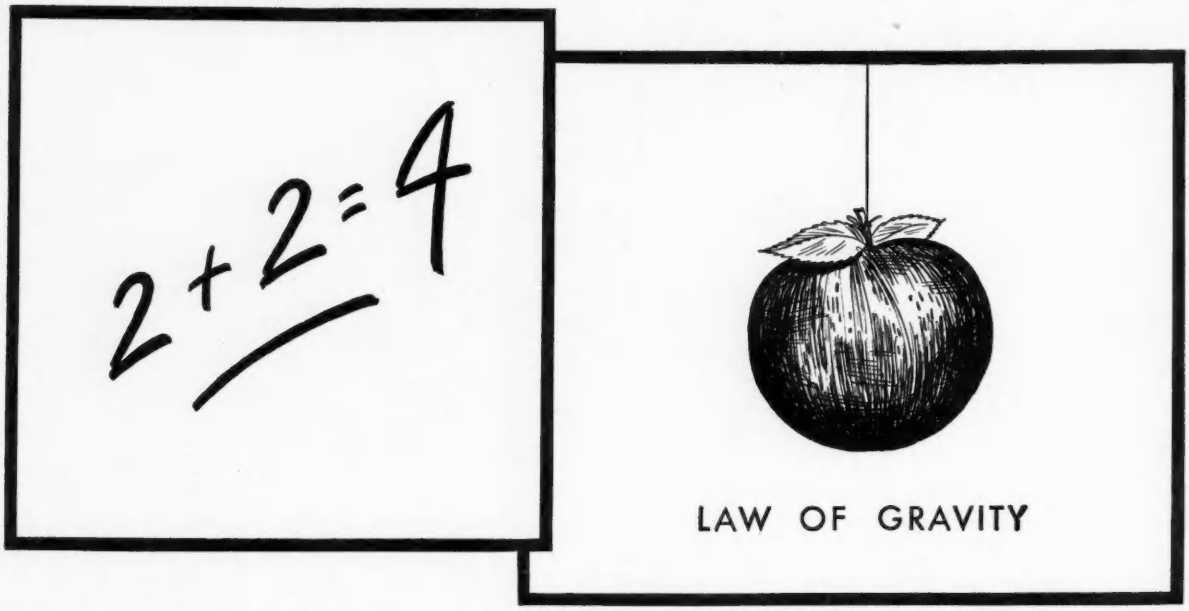
TWO SAFE BETS • •



FOR SCOURING AND DYEING WOOL YARNS

SOAPS or synthetic detergents — which gets the call for scouring and dyeing woolen and worsted Yarns?

Either Olate or Orvus will give you the efficient performance so essential in the scouring operation. In dyeing, it's Orvus all the way. Olate-scoured and Orvus-dyed yarn . . . or yarn scoured and dyed with Orvus alone . . . comes out soft, lofty, resilient, clean to the core. Here are their special characteristics—judge for yourself.

Olate

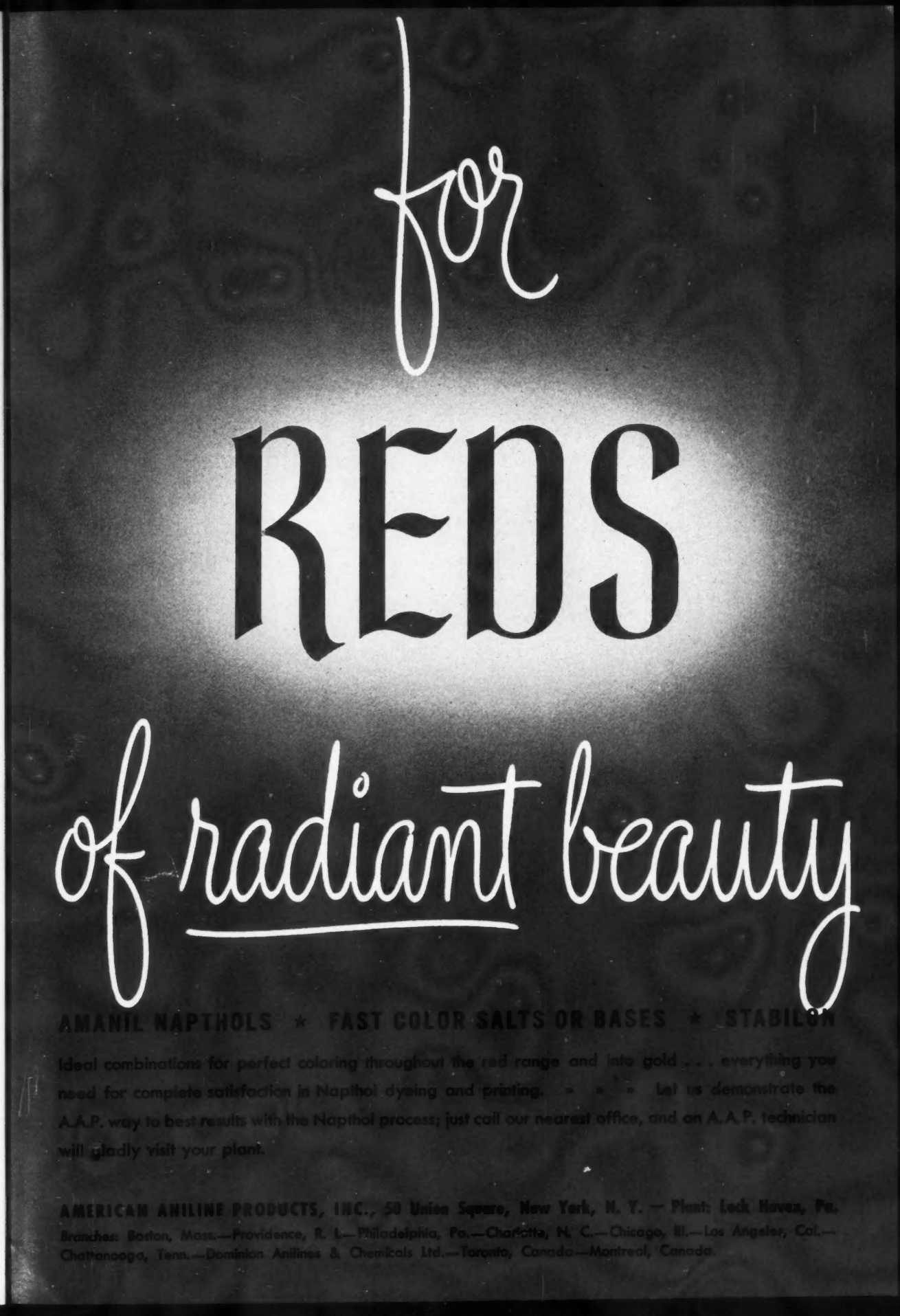
A pure, neutral flaked soap of exceptionally low titer and gentle cleansing action. • Fast dissolving. • Fluid solutions penetrate fibers quickly and thoroughly. • Excellent emulsifying properties. Holds spinning oils and dirt firmly in suspension until flushed away in rinse.

ORVUS *

A time-tested, neutral synthetic detergent. • Assures efficient removal of spinning oils. • Tends to reduce felting of yarn. • Effective in acid bath. • No hard water precipitates. • Softens and lubricates the fibers. Leaves yarn in excellent condition for subsequent operations. • Maximum safety.

* Talk over your Orvus needs with your Procter & Gamble salesman.

Procter & Gamble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REDS
of radiant beauty
AMANIL NAPTHOLS ★ FAST COLOR SALTS OR BASES ★ STABILON
Ideal combinations for perfect coloring throughout the red range and into gold . . . everything you need for complete satisfaction in Napthol dyeing and printing. » » » Let us demonstrate the A.A.P. way to best results with the Napthol process; just call our nearest office, and an A.A.P. technician will gladly visit your plant.
AMERICAN ANILINE PRODUCTS, INC., 50 Union Square, New York, N. Y. — Plant: Lock Haven, Pa.
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Due to its SUPERIOR HYGROSCOPICITY

CORPOLIN

is excellent in the vat print paste.

It has been found superior to glycerine and its substitutes.

OTHER ADVANTAGES . . .

CORPOLIN . . . *is available*
CORPOLIN . . . *develops best color values*
CORPOLIN . . . *does not affect the fibre*
CORPOLIN . . . *is non-corrosive*
CORPOLIN . . . *is low priced*
CORPOLIN . . . is *preferred* by the largest print works in the country.

CORPOLIN . . . is useful also as a moisture attracting agent in the warp size.

Why not try it? Sample is at your disposal upon request.

•

THE AKTIVIN DIVISION
HEYDEN CHEMICAL CORPORATION
393 Seventh Avenue, New York (1), N. Y.

For Everything Under the Sun

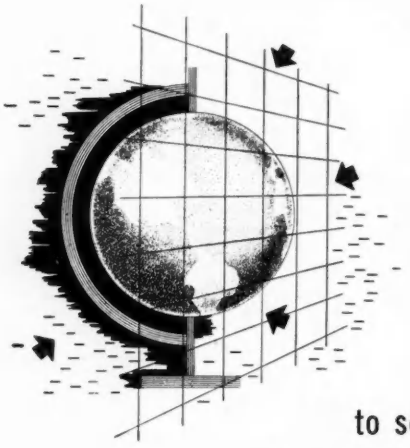
...CALCO DYES

When the success of a new fabric depends on the choice of the right dyes and the adoption of the best method of application, *rely on Calco.* For Calco offers a vast selection of dyes, ranging from highly efficient vat colors with superior resistance qualities to its recently perfected line of Calcofast Wool dyes for improved, economical textile applications.

Calco's Laboratories will gladly help you select the type of dye which best meets your specific requirements. CALCO CHEMICAL DIVISION, AMERICAN CYANAMID COMPANY, Bound Brook, New Jersey. New York, Chicago, Philadelphia, Boston, Charlotte, Providence

Reprints of this advertisement suitable for framing and without text will be sent on request.

Calco



Spin the Globe...

There's a FALLEK Representative Everywhere!

Here is your opportunity to secure World Wide Distribution for American Dyestuffs ...

READ THESE FIGURES!

92% of the world's total exports in Coal-Tar Colors, Dyes and Stains were supplied by Europe to the rest of the world.*

4.6% of the world's total exports in Coal-Tar Colors, Dyes, and Stains were supplied by the United States to the rest of the world.*

With foreign production at a minimum level, now is the opportune time for American Suppliers to secure a solid foothold in the most lucrative overseas markets . . . and here is how FALLEK can help you:

FALLEK . . . eliminates costly credit risks. *You receive your check when your goods are ready for shipment* . . . as simple as a domestic transaction, but larger profits.

FALLEK . . . creates an acceptance for your products throughout world markets that assures continuous business.

FALLEK . . . gains you the proper entree with leading firms of known responsibility.

FALLEK . . . gives you intelligent, daily sales coverage through representatives located in every world market.

FALLEK . . . means permanence, through long established outlets in Europe, Latin America, and the Orient.

FALLEK . . . saves you the detail handling and numerous expenses of operating an export department.

FALLEK . . . brings you men of wide experience, men highly skilled in the problems of world distribution . . . plus skilled technicians in every foreign office fully equipped to render all the technical information necessary to users of American Dyestuffs.

American dyestuffs for textiles, leather, paper, etc., are in urgent demand throughout the world. You can realize a sizeable share of this business by making FALLEK your foreign selling agents. THIS is the time to safeguard profits against the hazards of "buyer's market" or a falling off in domestic demand, by developing a substantial export volume. FALLEK can do this for you.

**U. S. Tariff Commission Report No. 19 last pre-war figures*

WRITE, WIRE OR PHONE FOR FURTHER INFORMATION.

FALLEK PRODUCTS COMPANY, INC.

149 BROADWAY • NEW YORK 6, N. Y.

SPECIALISTS IN ORGANIC CHEMICALS

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Contents

Contents of previous issues can be found by consulting the Industrial Arts Index at your library

• Special Articles

Dye Nomenclature: A Plea for More System..... 253
Wm. H. Cady

• Departments

Trade Notes—New Products..... 277

Communication 279

Patent Digest 280
Paul Wengraf

Abstracts from Contemporary Journals..... 282

• Proceedings of the American Association of Textile Chemists and Colorists

Williams Unit: Its Use in Textile Processing.....P256
S. H. Williams

One Hundred and Fifty-Seventh Council Meeting..P263

The Production of Fast Shades on Mixed Fibers:

Dyeing of Fast Shades on Piece Goods Containing Cotton or Viscose Rayon Mixed with Wool..P265
L. S. Thompson

The Dyeing of Fast Shades on Piece Goods Where Nylon and/or Acetate are in Mixtures Containing Wool P267
H. F. Clapham and G. R. Turner

Dyeing of Yarn Blends Containing Wool as One Component P269
Ormond W. Clark

Discussion P275

Employment Register P274

Meeting, Philadelphia Section P276

Meeting, Rhode Island Section.....P276

Calendar P276

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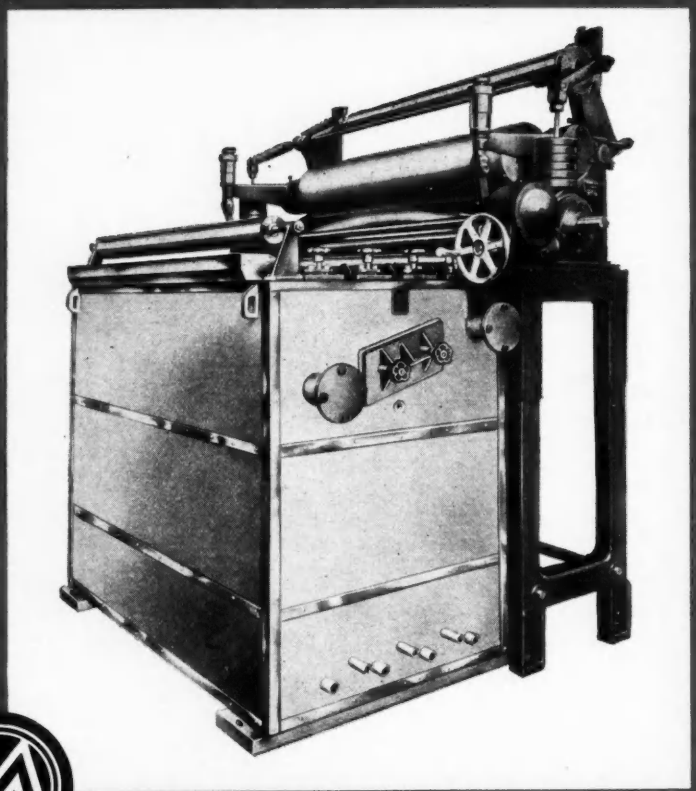

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AMERICAN
DYESTUFF REPORTER

VOLUME 36 MAY 19, 1947 NUMBER 10

Dye Nomenclature:

A Plea for More System

WM. H. CADY

ANYONE who has daily contact with our commercial dyestuffs cannot fail to be impressed by the lack of uniformity and system in the selection of names which have been assigned to many of the dyes by their manufacturers.

Review of Literature

As far back as 1917, a writer(1) in the "Manchester Guardian" (also quoted in the "Color Trade Journal"), referring to the practice of "renaming of dyes after naturalization in this country," remarked, "We are still only at the beginning of our range of indigenous dyes, and if the process of renaming is to be continued throughout, it is worth while to examine the principles upon which dyes have hitherto been named and known. The further question will also arise whether it is at all necessary to invent new names for well known dyes. . . When one considers that one class of dyes with generally similar properties were sold under at least sixteen group names, and that under one such name would be included, for instance, as many as fifty 'brands' of black, each with its own 'mark' of letters or numbers, one may complete the picture of the dyer's confusion and also realize the role of the colorist."

J. M. Matthews(2) in 1920 published in the "Color Trade Journal" a complete list of the "various trade names of various groups of dyes" in use at that time, and wrote, "Attempts have been made to systematize and classify dyes for the purpose of simplifying their nomenclature and thus identifying the product by some universally accepted designation; but all these attempts have been more or less abortive."

In an article in the "Chemical Age" in 1927 which was reproduced in the "American Dyestuff Reporter," L. J. Hooley(3) commented on the lack of uniformity in the formation and selection of dye names, some of which, he stated, were based on chemical constitution, some on color names (mostly derived from the Greek), some on usage, and some on the manufacturer's name. He suggested that every dye should be given a name consisting of three parts: a compound word composed of a "symbol" (to identify the manufacturer) and a "label" (-anthrene, -anil, -acyl, etc.) to indicate the usage group to which the dye belonged (this would be uniform for all dyes in this group, regardless of their origin); a second word suggesting the color of the dye; and finally "a number and not more than three letters" to indicate variations in the shade, etc. He predicted, "Under this arrangement names would be no longer than at present, (and) each color would be self explanatory as to maker, series and principal use. . . Significant syllables could be chosen so as to be as distinct as possible from each other and also so that they could be varied to fit in phonetically with contiguous syllables without losing their identity." He admitted, however, that "any considerable alteration in existing names is quite undesirable, for name changing on any scale is always an awkward reform."

More recently, an article (4) which appeared in the "Dyer and Textile Printer" and the "Rayon Textile Monthly" in 1945 commented on the confusion which results from the lack of system in modern dye nomenclature and summed up the situation as follows: "The primary object in the naming of a dye should be to give an exact description of its properties in a minimum of three words, with additional data in the form of numbers and letters."

C. L. Bird(5), in the "Journal of the Society of Dyers and Colourists" in the same year, listed the more important group names of the British, French and Swiss dyes in use in England, showing the complete lack of uniformity in present-day names and their terminal letters. He made a specific recommendation for renaming all dyes according to a definite system, in which every dye name would be divided into three parts, "the first part defining the dyeing class, the second part announcing the colour of the dyeing obtained on the substratum most commonly used, and the third part indicating the strength of the dye in terms of an arbitrary standard, e.g.—Naphthalene/Orange G/125."

Origin of Names

To go back to the beginning of the modern dye industry: the naming of dyes was a simple matter when only a few dyes were known, and when there was only a small group of manufacturers. Such names as "Magenta," "Tartrazine" and "Eosine," of historical, chemical or etymological origin, were universally known and used. As dyes multiplied, and as several firms began to manufacture the same product, the tendency arose for each company to attach its own designation to dyes in the same usage group to identify the source; thus, a direct dye of a particular type was known as "Benzo," "Diamine," "Dianil," etc., according to its manufacturer. Gradually a further change developed, when dye-makers started to incorporate in the names of their dyes a part of their corporate title. This led to such names as "Pontamine," "Calcosol," "Cibacete," etc. This system, while undoubtedly serving the useful purpose of identifying the manufacturer of a dye, has resulted in destroy-

ing, to a considerable extent, the identity of the usage class to which a dye belongs, unless the user is familiar with the "language."

Inconsistencies in Year Book

The situation would not be so serious if all dye-makers would use a common termination (or prefix) for all dyes of the same usage class. This, unfortunately, is not the case. Let us examine some of the names listed in the "Tabulation of American Dyes" in the 1946 Year Book of the AATCC.

Under "Direct dyes" we find several names ending in "-mine," such as "Pontamine," "Chloramine" and "Diamine," but we also find "Fastusol," "Diphenyl," and "Amanil."

Under "Developed Dyes" we find several with the prefix "diaz-", such as "Diazo," " Diazamine" and "Diazine," but we also find "Indigene" and "Rosanthrene."

Under "Formaldehyde dyes," nearly all have the prefix or suffix "form" as in "Benzoform" or "Formanil" (this class is an exception to the general rule).

Under "Sulfur dyes" we find some tendency to use the suffix "-gene," as in "Calcogene" and "Sulfogene," but also "Acco," "Amalthion," "Sulfindone" and "Thional."

Under "Vat dyes" we find a number ending in "-threne," such as "Carbanthrene" and "Indanthrene," but also "Anthra," "Calcosol," "Cibanone" and "Hydroform."

Under "Acid dyes" we find some ending with "-ol," such as "Alphanol," "Azanol" and "Supranol"; but also "Aceko," "Apocid," "Ethonic," "Kiton," "Polar," "Pontacyl" and "Xylene."

Under "Mordant Acid dyes" we find a general tendency to use the suffix "-chrome," as in "Calcochrome" and "Erio Chrome," but also "Aposide" and "Kromeko."

Under "Acid (Metallized) dyes" we find five ending in "-lan," such as "Chromolan" and "Vitrolan," but also "Calcofast," "Chromacyl" and "Nyasol."

Under "Acetate dyes" we find several ending in "cel" or "-cyl," such as "Amacel" and "Triacel," "Altocyl" and "Setacyl," but also "Acetamine," "Artisil," "Cibacete" and "Eastone."

The Azoic dyes mostly end in "-ol" (e.g. "Pharmasol") but there are some with "-gen," such as "Rapidogen."

Under "Basic dyes" the tendency is to adhere to the original names (Bismarck, Methyl, Methylene, etc.). An exception is "Calcozine."

The above names are merely illustrative, and do not by any means exhaust the list. On examining the entire Tabulation carefully, it will be observed that the same termination is frequently used in dyes of totally different usage groups. Thus, the suffix "-gene," or "-gen," while predominating in the Sulfur dyes, is also used for a part of certain Azoic and Developed dye names. The suffix "-sol" is scattered through the whole list, being found in Direct, Vat, Azoic, Acid, Soluble Vat, Metallized and Spirit Soluble dyes. The suffix "-cyl" is also found in such wholly unrelated groups as Acid and Acetate dyes. The prefix "form-" besides its regular use in Formaldehyde dye names, appears also in an Acid dye and as a suffix in a Vat dye. The suffix "-zine" is found in Developed, Mordant Acid and Basic dyes. In addition, occasionally the same name is used to designate dyes in two distinct groups; thus, "Benzyl" is in the Acid and Basic columns, and "Anthra" is in the Acid and Vat columns.

From the above it will be seen that it is next to impossible to determine merely from the name of a dye the particular usage group to which it belongs, until one learns the "language." The situation would be greatly improved if all the manufacturers would agree on a common system of suffixes, such as the following: "-mine" for Direct dyes; "-diazo" for Developed dyes; "-form" for Formaldehyde dyes; "-gene" for Sulfur dyes; "-threne" for Vat dyes; "-cid" or "-cyl" for Acid dyes; "-chrome" for Mordant Acid dyes; "-cel" or "-cet" for Acetate dyes; "-lan" for Metallized dyes; and "-sol" for Spirit Soluble dyes. The rest of the word could be something to identify the manufacturer.

Objection may also be raised to the too frequent use of the word "fast." Of the 6732 dye names in the Tabulation, 1102, or 16.3 per cent, contain it either as a separate word or as a syllable in a compound word such as "Fastusol" or "Calcofast." It should be remembered in this connection that the dyes usually regarded as of prime fastness (the Vat dyes) do not ordinarily carry the word "fast" in their names, so that the word as presently applied has lost much of its meaning. It sometimes refers to fastness to acid or alkali, but more often to light fastness. A more precise terminology would be desirable.

System of Terminal Letters

Turning now to the letters customarily used with each dye name to indicate particular shades, strengths or properties, Bird(5), in the article already referred to, classified the terminal letters used in all dyes employed in England, and found much confusion. Thus, the letter "D" may indicate "Dischargeable," "Drück" (printing) or "Dark"; "L" may indicate "Leather," "Light Fast" or "Löslich" (soluble); "S" may indicate "Schweiss" (perspiration), "Silk," "Soluble" or "Standard." Only a few cases are quoted here, but the list could be greatly amplified, and the same situation obtains in this country. The writer(4) in the "Dyer," previously referred to, proposed a standard system of terminal letters, each with only one meaning, as follows:

A—aftertreatment required
B—bluish: degree of blueness to be indicated by numbers
C—chlorine-fast
D—dischargeable
E—equalizing or level-dyeing
F—pure
G—greenish (as B)
H—heat sensitive
I—"Indanthrene" fastness
K—cold dyeing
L—light-fast
M—mixture
N—new; improvement on an existing standard
P—potting-fast
R—reddish (as B)
S—standard or type strength
T—deep (tief)
U—unlevel unless controlled
W—water-fast (bleeding and spotting)
X—extra concentrated
Y—yellowish (as B)
AR—acetate reserve
WR—wool reserve
CR—cellulose reserve
SB—soda boil fast

While this proposal will probably not meet with unanimous approval in this country, it would seem as though some such system could be agreed upon by the various manufacturers, if enough interest were shown by the consuming public. Perhaps the American Standards Association could take the leadership in this matter. Certainly the present system is thoroughly unsatisfactory and will grow steadily worse as the number of dyes multiplies.

Conference on Nomenclature

The publicity given to this problem in the British journals in 1945 led to the calling of a Conference on Dyestuff Nomenclature by the British Standards Institution on November 29, 1946. This was attended by representatives of the dye manufacturers, users, and research and scientific societies. A prominent member of the Society of Dyers and Colourists who was at the meeting stated in a private communication to the writer, "Both dye manufacurers and dye users strongly deprecated any changes in established names which could only lead to worse confusion for at least one generation. It

(Concluded on Page 279)

Proceedings of the
American Association of Textile Chemists and Colorists

MAY 19, 1947

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Williams Unit:

*Its Use in Textile Processing**

S. H. WILLIAMS

General Dyestuff Corp.

History of Development

THE original idea regarding this mechanism grew out of a need for a small machine, capable of dyeing a wide range of vat colors by a suitable continuous process. In 1929, at Crystal Springs Bleachery,, Chickamauga, Georgia, we made our first practical trials in dyeing dark shades on cotton piece goods, using vat colors, by the continuous pigment method. The dyeing machine used was a conventional continuous vat range, consisting of pad, large booster boxes, followed by regulation washing, oxidizing, and soaping compartments. At this time we ran considerable yardage by the continuous pigment process, using this conventional equipment. The success of the lots processed varied considerably in a direct proportion to the types of dyestuff used. A great deal of knowledge was obtained at this particular time, working with this method of dyeing.

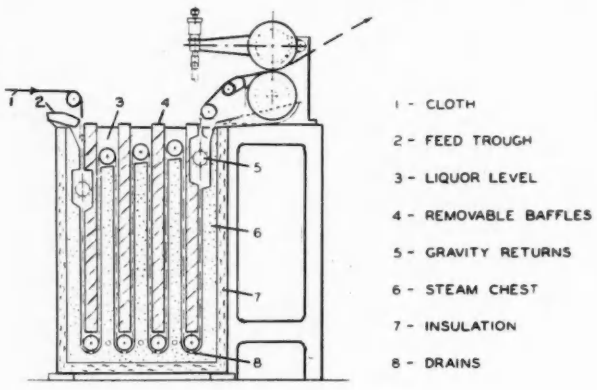
The main drawback of the machine used for these experiments was the volume of the reduction box, which had a capacity of over 1000 gallons; however, our investigations of vat colors indicated that it should be possible, by using a high temperature reduction box, to produce dark shades by a suitable continuous pigment method. One of the problems that presented itself was the maintaining of a controlled balance of bleed-off and exhaust of the vat colors in this first high temperature box. Results clearly indicated that by entering pigmented material either in a wet or dry state, by using accelerated reduction temperatures, with balanced amounts of caustic and hydro, the time factor for continuous dyeing could be cut down considerably.

The outcome of these original trials and dyeings caused us to continue our work and efforts to develop this process into successful practical application. In 1933, we discussed this method at Union Bleachery, and this plant agreed to re-design a continuous machine which might lend itself to continuous vat color pigment application. A machine was constructed, utilizing five compartments. Each compartment was blocked off in area, and a gravity flow regulated from the first compartment to the last. The principle of this machine was the use of high temperature reduction, being carried out in a series of baffled boxes and the liquor volume decreased in each successive box. Our work at this plant, along this line, showed considerable encouragement, but the machine, as designed, had a number of mechanical drawbacks, which were extremely troublesome. Our chemical costs, by using the five boxes, were higher than the costs of the same shades produced by the pad jigg method. It was clearly seen, from the results we obtained, that what was needed was a small volume high temperature reduction box, constructed to hold as little liquor as possible, and at the same time designed to be practical. It was agreed that the machine, to be successful, should hold a maximum yardage of cloth and a small volume of water, and that the cloth should be held under the surface of the working liquor, to prevent as far as possible any premature oxidation. Of further importance was the heating design for maintaining dyeing temperatures over a wide range.

Working with these factors, we designed and built our first laboratory unit, incorporating the features mentioned. On this laboratory machine we reinvestigated the reduction times of the entire range of vat dyestuffs, but we did not measure the factor of turbulence and mechanical agitation. Upon completion of our experiments, we felt rather certain that it would now be possible to build a practical plant machine.

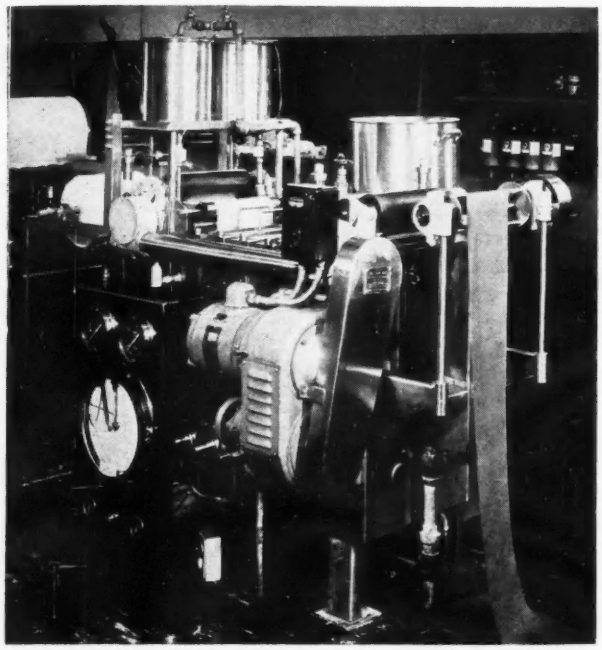
We then discussed this process with the American Finishing Company, and they became sufficiently interested to build a full scale experimental unit. Three practical full sized machines were built by this company before one was mechanically perfected. When we felt assured that this unit would produce a dyeing job superior to the methods which were then used, we called the Morrison Machine Company of Paterson, New Jersey, to the plant to look over the design of this equipment. After seeing the results that were being produced, this company was willing to take over the manufacture and sale of the Unit.

The practical plant operations which we observed upset our table of time factors for the reduction of vat colors, that had been so carefully worked out. Time factors were shortened considerably, due to the physical action of the dye liquor in its travel through the Unit, which introduced a problem that up to that time was

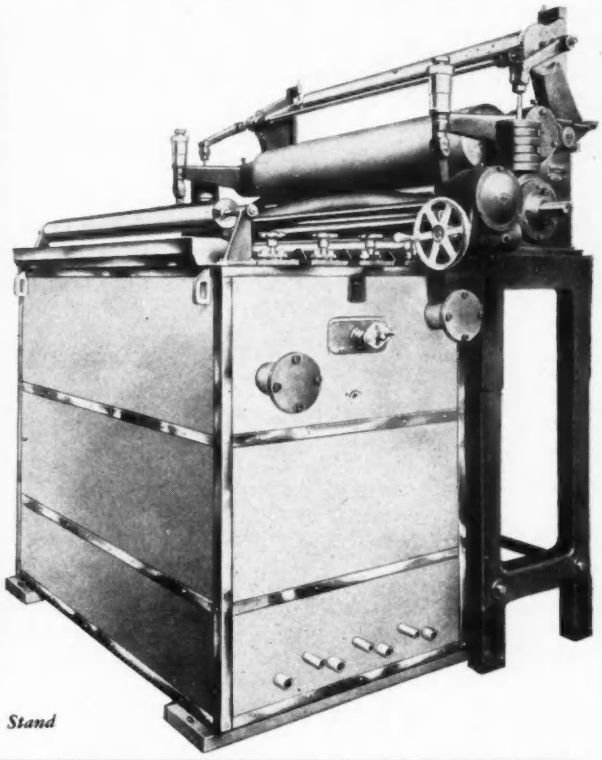


Williams Unit
Covered by U. S. and Foreign Patents

* Presented at meeting, New York Section, March 7, 1947.



Laboratory Model of the Williams Unit.



Stainless Steel Williams Unit with 5-Ton Microset Nip Stand (Entering End). →

not measurable on a small scale. At this point it was forcibly brought to our attention that this physical action, in the reduction of vat dyestuffs on fabrics under tension, would have to be studied and charted. It is as much a factor as temperature, time, and the concentration of the reducing chemicals used.

We are still of the opinion that the maximum values present in many vat colors are not being produced in a number of practical plant operations. Many dyestuffs reflect in continuous pigment reduction, when reduced on the fiber, a far greater percentage of their total color values than others. By the use of variable methods, of new chemical formulations, surface color reflection, producing greater values in this respect is certainly possible.

Application research of vat color dyeing will bring to light many new developments in the near future. These will be brought about by a combination of methods, coupled with changes in chemical application. We certainly have not reached the optimum results in many of our dyeing processes, but we have made considerable progress, as compared with past performances.

The ingenuity of dyers, colorists, and chemists, is still required, and their resources challenged today as never before in the processing of textiles with vat dyestuffs. A technically well trained organization is required in order to obtain best results in the production of the variety of textile fabrics on the market today. Our experience to date has shown that many plants are producing results far superior to others, on the same fabrics, with the same mechanical setup, using the same class of colors. There seems to be no substitute for knowledge, resourcefulness, and experience in practical vat color application. When using the Williams Units, skillful control and human guidance are the governing factors in the production of best results. The same may be said with regard to jigg operations or any other form of color application.

The dyeing of textile fabrics covers such a wide field that there are very few set and pre-determined rules that can be laid down that would cover the many shades, qualities, and constructions that are now being processed. There are many existing possibilities of various methods to be used in the dyeing of fabrics on these units. To speak specifically, it would be necessary to know in detail the depth of shade, type of material, method of preparation, and the mechanical setup available.

Light Shades of Vat Colors

Many light and medium shades can be and are being run successfully and very satisfactorily by adhering to the reduced, re-reduced method of dyeing. With the proper pad setup, this is relatively a simple process. When using the Units for re-reduction, accelerated temperatures are used to a decided advantage for the re-reduction operation. This method is satisfactory on many cotton fabrics. There are styles and qualities where it is a decided advantage to apply the pigment first, rather than reduced color, even in light shades, in order to produce a more solid, better penetrated dyeing.

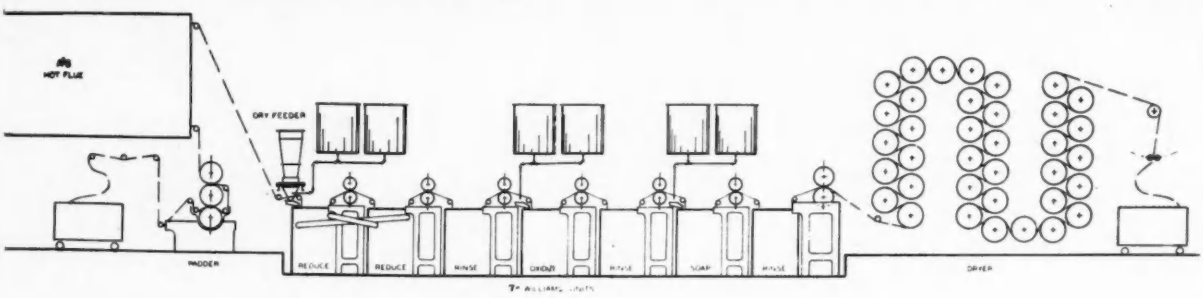
Algosols, or the Water Soluble Vat Colors, for the Production of Light and Medium Shades

This class of dyestuffs lends itself to continuous operations. The colors may be padded and developed successfully on the ranges mentioned.

The continued use of stainless steel, even when using the SMO brands, is still questioned, regarding the ability of this metal to withstand strong mineral acid and nitrite baths which are necessary when dyeing these colors.

Intermediate Drying in Continuous Pigment Vat Color Application

Whether fabrics or combinations of



A Complete Unit, All-Purpose Range

This range is designed for high speed operation of dyeing, aftertreating and soaping in a continuous manner. Features of this layout are:

Double unit connection, when speeds justify the required use of two units for any given dyeing operation.

Heavy and light weight fabrics may be processed at high speeds, using Indanthrenes, Algosols, directs, sulfurs, naphthols, and paras.

This all unit range is said to develop the highest efficiency in carrying out the various rinsing, oxidizing, and soaping operations by using units in place of conventional boxes, following the reducing or developing units.

Total volume capacity of a 50-inch range is approximately 450 gallons for the 7 units.

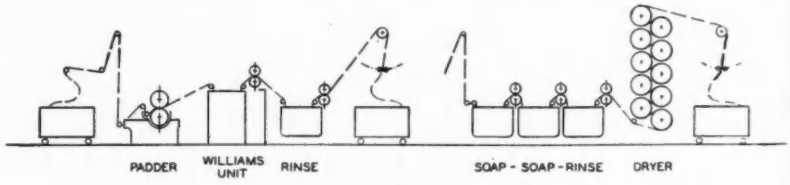
Units are shown installed below floor level, allowing operators to observe top working areas conveniently.

Diagram shows setup of the units for vat color dyeing.

colors should be pre-dried, either wholly or semi, before reduction has been questioned many times. Based on our experience, we have come to the following conclusions:

There certainly are advantages in the drying of vat pigments on many constructions before reduction. Fabrics that are closely woven, and particularly with tightly twisted yarns, such as ducks, twills, drills, gabardines, poplins, etc., are dyed to a more solid appearance when the vat pigment is applied and then pre-dried before reduction. From an operational standpoint, complete drying is more desirable than semi-drying; however, many highly productive ranges are satisfactorily operating at high speeds, where the drying capacity does not permit full drying, and are producing excellent results. Aside from appearance of the dyed fabric, better control is maintained in the reduction unit when dry cloth instead of wet is entered, the reason for this being that the normal absorption of a dry fabric takes up, at an even rate, a greater percentage of the reducing liquor and the bath is replenished at a faster rate of speed. It has always been extremely difficult, in processing wet material through a box containing a small volume, to control the moisture replacement to a definite and reliable degree. On the other hand, there are many open constructions of cottons and mixed fiber qualities that dye to a disadvantage when pre-dried.

High velocity forced air driers tend to produce a reediness on open and thinly woven uneven fabrics; a form of color migration, which is not completely overcome in the reduction baths, takes place. Can drying of pigments on many shades



Single Short Range

The layout shown above may be convenient for a number of plants not having space to incorporate washing, oxidizing, and soaping operations in one continuous range. Many fabrics may be dyed or chemically treated on this range and then taken to the soaper for final finishing. Plants processing many styles and short runs may find it advisable to install a number of short installations of this type, and feed their materials from these ranges to high speed soapers and dryers.

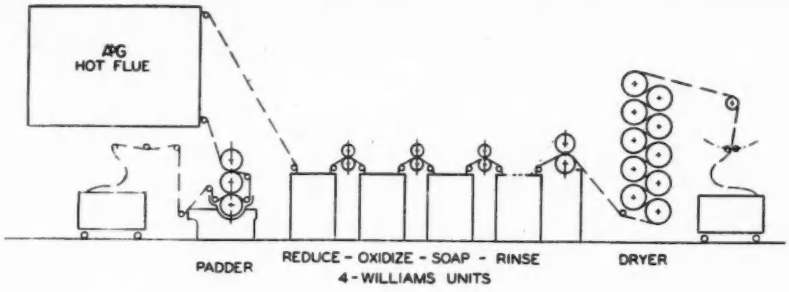
Many flexible continuous operations may be carried out, using this layout, which does not require a large amount of floor space.

and many constructions may be successfully carried out, if certain precautions are taken. In such cases we find that the cans certainly should be seamless and, for the best results, the heat graduated from stack to stack. If thickening agents are used, which is practiced in many cases, can drying produces the hazard of pigment color's picking off on the cylinder surfaces, which results in dyeings having a poor surface appearance. If drying is to be carried out, the most suitable means is the used of an Andrews and Goodrich Algosol type dryer, which is best put in range with the pad and reduction units.

Continuous Methods of Dyeing Cotton Piece Goods

In most finishing plants doing fast color work new installations of equipment should be designed to be extremely versatile. Continuous dyeing ranges, designed to make use of the many groups and classes of dyestuffs and processes, should be laid out in the following manner: a 3-roll pad, flexible to a point where it may be used either as a 2-roll or a 3-roll, with a type of pad box that may be used successfully for the application of running reduced vat colors; an air dryer, following the pad operation; and, following the drying, the necessary reduction, oxidation, washing units, and a stack of dry cans. Any plant having available any form of a continuous open box range may add to it, without too much trouble, the units for reduction and an air dryer. A single unit may be used satisfactorily for reduction purposes, provided high production speeds are not called for in the dyeing of heavy shades. Two units piped together, acting as one reduction medium, allow for maximum speeds and faster running times.

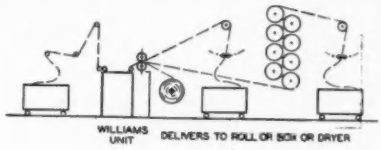
At the start of dyeing operations it is necessary to properly charge the reduction unit with the correct balance of chemicals, then set up the feeds and control them to maintain the starting concentrations. The proper selection of dyestuffs in each combination is still an important factor conducive to good shading. Any dyer experi-



Dyeing Range

A short continuous dyeing range suitable for dyeing almost all classes of dyestuffs. It requires limited floor space and is extremely flexible. The following classes of dyestuffs may be applied to advantage on this range: Indanthrenes, Algosols, directs sulfurs, naphthols and paras.

It is well suited for the treatment of fabrics requiring multiple chemical applications. The diagram shows the set-up of the units for vat color dyeing.



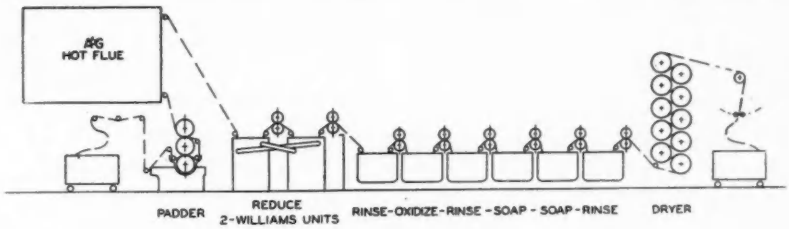
Single Unit

This setup is used for dyeing and chemical treatments of fabrics requiring only one operation before drying. It illustrates the batching arrangement from the unit. Materials may be dropped in the box or taken in continuous operation to the dry cans. This setup may be used to advantage in any process requiring complete saturation of the fabric before squeezing, such as for the application of wax emulsions, oils, and various other chemical treatments.

enced in the handling of vat colors is certainly aware that when an excessive charge of caustic and hydro is added to the unit for reduction purposes, the point of reduction can be exceeded. Caution must be taken in this respect or a stripping action will take place, resulting in the loss of predetermined color value. As the behavior of vat colors, with regard to their solubility and speed of fixation, varies considerably, the correct formula should be used in each case, if maximum color values are to be developed. A few general rules in this respect are as follows:

Easily solubilized vat dyestuffs, such as the colors falling in the class of the IW and IK types, require the use of fairly large quantities of common salt, to be added to the reduction bath. This is done to prevent or minimize the extent of bleed-off of these colors while the color on the cloth is being reduced. The quantities of caustic soda used on these classes of colors is much lower than those required for the use of the IN brands. A proper balance between alkalinity and the amount of hydro used is an important factor, particularly with respect to the dyeing of the Indanthrene Blue brands, such as the Indanthrene Blues of the BCS types. To produce maximum results with this dyestuff, the concentrations of caustic soda should be greatly increased, as compared with the other IN types of colors. The amounts of hydro should be decreased. An excessive amount of hydro, at elevated temperatures, breaks down this dyestuff rather rapidly in the presence of strong alkaline solutions. By the use of glucose, or other suitable reducing sugars, it has been found practical to dye this color with very good results, producing brilliancy of shade, proper color value, and the necessary fastness. The glucose, or reducing sugar, may be padded in with the vat pigment color.

It is common practice in a number of



Double Unit Installed Before Conventional Range

Many plants having available an open soaper, or similar range, may install a single or double unit in line for carrying out the dyeing, reducing, or developing operation in an efficient manner without involving too great an outlay, using the conventional boxes for rinsing, oxidizing and soaping. The diagram shows the setup of the units for vat color dyeing.

cases to add a small quantity of pad liquor to the Unit before the start of dyeing operations. When using a formula of dyestuffs having the same relative exhaust and solubility, this practice may be carried out satisfactorily; however, it is not always possible to produce a shade with dyestuffs having properties close enough to follow this procedure. An example of color charge is as follows:

Should the pad liquor contain:

6 oz. per gallon of Indanthrene Olive TA

and 3 oz. per gallon of Indanthrene Orange 3GA,

it would not be proper to take a gallon of this pad liquor and add to the Unit. The Unit charge would be close to being correct by adding a separate weighing of

6 oz. Indanthrene Olive TA and

6 oz. Indanthrene Orange 3GA,

the amount of Olive TA equalling 1 gallon pad liquor, but the Orange is double the ratio contained in the pad, the slower exhausting color being added in excess of the ratio of the fast exhausting color.

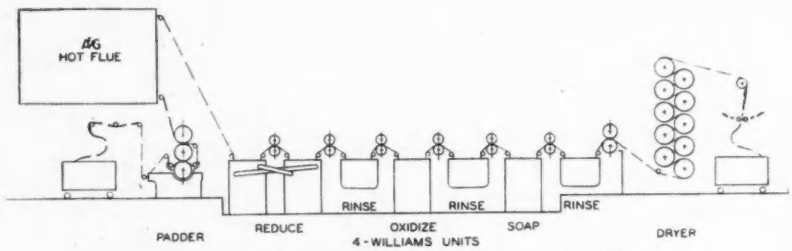
Another important factor in the maintaining of good shading is keeping the working liquor in the reduction units at all times at an even height. There are many types of liquid level controls that are being used satisfactorily in practice to control this operation.

The automatic feeding of dry hydrosulfite has proved to work out to an advantage in governing a uniform reduction bath. Working with dry hydrosulfite effects a saving on this chemical, due to its instability when used in solution form.

Continuous Dyeing of Rayons and Mixed Fiber Constructions

Up to this point we have mentioned mostly the handling of only cotton fabrics continuously. The continuous handling of synthetic fabrics and types of rayon mixtures is fast being adopted for highly productive purposes. Consumer demand for washable rayons and mixtures is an important market factor in the sale of these textiles. Shrinkage control and the recent developments in this field, along with fast dyestuffs, aid in giving consumers a fabric and color that will stand washing. Vat colors are the answer to satisfactory washable dyes.

The technicalities of application on many qualities represent a problem that in many cases requires considerable ex-



Dyeing Range Consisting of Units and Conventional Boxes
This illustration shows the use of units in positions where vital operations are concerned, i.e.: dyeing, oxidizing, soaping. From an initial cost layout, regular conventional boxes may be used in the rinsing operations.
The diagram shows the setup of the units for vat color dyeing.

perimentation before dependable practical formulas can be worked out. The many varied constructions and small dye lots have retarded to some degree the continuous processing of many synthetic and rayon specialties. Small lots can be handled economically by using the Williams Units. These specialty fabrics in many cases in the future will become staple lines; and when large lots are available to the dyer and finisher, those not equipped with continuous equipment will have a difficult time competing with such installations.

A number of rayon fabrics and mixtures of synthetics are now being processed with vat colors in the South, the dyeing speeds equalling those of many cotton fabrics.

In the dyeing of mixed fiber constructions, the ability of a dye machine to function over a wide range of temperatures is extremely important. There are many color combinations and fiber effects that may be produced in temperature ranges of 170°-180° F. that would not be possible when working at temperatures of 200°-212° F. Many examples of this are shown in the dyeing of fabrics containing acetate, leaving acetate white and still producing heavy shades of vat colors. In the dyeing of wool mixtures, temperatures must be regulated against time factors to a point to prevent degradation of wool and at the same time be within a range that will properly reduce and reflect the true color values of the dyestuffs used.

There are many dyeing operations on many qualities of fabrics, where fiber effects are desired, rather than the full reflection of the color values of the dyestuff. It may be necessary to add to the reduction unit, in cases of this nature, retarding and emulsifying agents, such as Peregal O, which will tend to level up many differences of affinity between warp and filling, or aid the differential in affinity between two different types of fibers. Examples in the handling of mixed fibers of certain constructions have shown that should the dyestuff be fixed on the fabric as padded, the resultant appearance would not be solid in character. By the use of retardants, or emulsifying agents, the vat colors in certain cases can be leveled from one fiber to the other and more solid effects produced.

Direct Color Dyeing

During the past year there have been many fabrics and considerable experimentation carried out with regard to the application of direct colors on these machines. We have seen many qualities that have been run on this equipment and that have surpassed in appearance the same constructions when dyed by other methods. An example of a particular quality is an 80 per cent spun rayon and 20 per cent wool fabric. This fabric, when dyed on boxes or reel machines, has a tendency to show up warpiness, mill imperfections, and cloudiness in some colors. These same shades, produced on the Units by first padding on the direct and acid colors in the pad and further fixation in a common salt bath, dye in the Unit to a much more level and solid appearance. It is extremely important, when handling direct dyestuffs, that the proper combinations be selected from a standpoint of rate of exhaust.

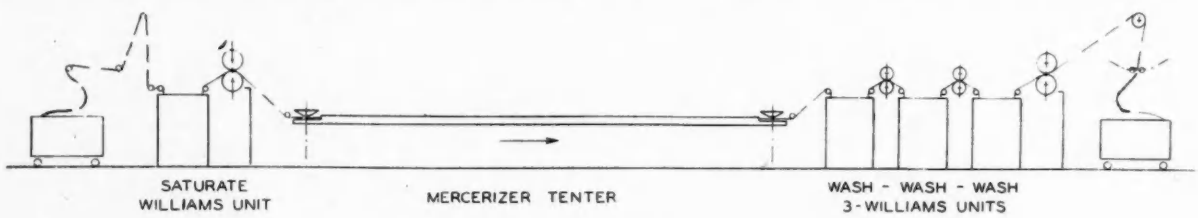
On fabrics and shades which may be dyed continuously with commercial colors, considerable labor savings may be accomplished, and a quality of work that is superior in many cases to conventional dyeing methods can be produced. An example of time saved was a recent report on the dyeing of 160 pieces of the above-mentioned quality (80 per cent spun rayon and 20 per cent wool), which was processed on a small Unit range in 3½ hours of running time, using 3 men. Using regulation dye becks, this lot would have taken 8 machines and consumed 8 hours of labor.

Sulfur Colors on Cotton Pieces

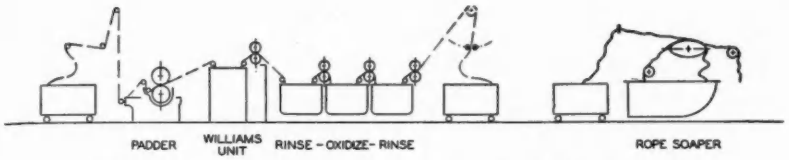
Sulfur dyes may be applied by the unit principle in either of three ways:

1—The Unit may be used in the same manner as one would use a three-roll pad. There are many advantages that are produced when working in this manner. The maintaining of boiling temperatures is relatively simple in the unit, due to its method of construction, being completely jacketed and insulated; and the cloth, being kept under immersion rolls at all times, does not prematurely oxidize while in the dyebath. The ratio of contact of cloth with the small volume of liquor is another decided advantage in sulfur color dyeing.

2—Sulfur colors may first be applied on a three-roll pad and then entered into



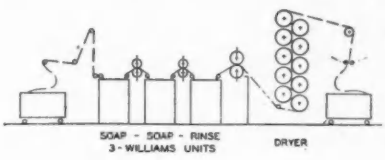
Mercerizing Range
This illustration shows a unit for caustic saturation, as well as three units for recuperating and washing.
Units may be piped for back washing, caustic storage, to evaporating systems or drains. An advantage of using a unit for caustic saturation (insulated and designed so that cold brine solutions can be circulated within the jacketed space to cool and maintain constant temperatures at point of saturation) is evident when mercerizing at low temperature is desired.



Short Continuous Range for Rayons, Mixed Fabrics, Toweling, Etc.

As a great many rayons and other constructions are soaped off in rope form, a short dyeing range of this type lends itself to the processing of these fabrics with Indanthrene and other classes of colors. Normally, rayons are run at slower speeds than cottons; therefore, conventional wash and oxidizing boxes may be used for these operations.

Indanthrene colors may be applied in the pad in either a reduced form and the unit used for re-reduction, or the pigment vat color applied on the pad and reduced in the unit at high temperatures.



Compact Soaping Range

The illustration shows a 3-unit setup continuous with dry cans.

This installation is being used for soaping and washing. This is a compact range requiring only a small amount of floor space. It is suitable for soaping off prints, plain shades chemical removal, etc.

the Unit for the addition of further color, or for further fixation, in the same manner as one would use a booster bath.

3—Dispersed sulfur colors may be padded and then fixed in the Unit on the same order as in dyeing vat colors.

Naphthols

The Units have worked out very satisfactorily when dyeing this class of colors, using the Unit for the coupling bath. They are so constructed that cold water or brine may be circulated in the jacket, in order to produce and maintain temperatures sufficiently low to prevent decomposition of the solutions used in this operation. Added flexibility for very short runs may be made use of by utilizing part of the one well near the delivery end of the machine. As each well holds approximately 15 gallons of liquor, by utilizing any depth of this well, a working bath may be used, containing from 3 to 12 gallons of liquor. In many cases the use of such may be more advisable than using a pad in a similar manner, the reason being the greater contact of cloth with the developing liquor before the nip, and at the same time a very small working volume is utilized.

Varied Operations

There are many operations and many fabrics that are processed in the textile industry, where the immersion in the average pad or box is not sufficient to produce absorption before the cloth is squeezed at the nip. An example of this is in the application of wax emulsions to heavy fabrics, such as ducks, where it is necessary to throw down onto the fabric a certain per cent of wax. Such an operation requires the maximum of contact of cloth with the liquor before the squeezing action takes place. This holds true with regard to many chemical treatments. Poorly absorbent materials should be thoroughly saturated before squeezing, and this can best be accomplished to an advantage, with a maximum yardage of contact and a minimum quantity of liquor, by using a Unit.

Investigations are being made with respect to the continuous dyeing of woolen fabrics on these machines.

Washing and Scouring

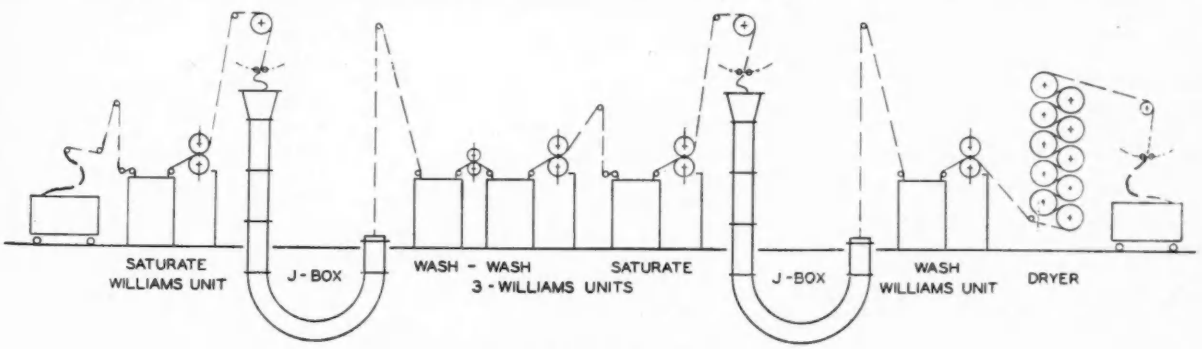
Up to this time we have talked about this machine with regard to the application of dyestuffs. As paradoxical as it may seem, this unit is used to a decided advantage in the removal of chemicals, in operations such as washing, scouring, etc. Many installations are now being operated very efficiently by the use of these Units, following a mercerized range. Figures available by plants that have made these installations confirm their success in this field. These Units have replaced to an advantage many of the older forms of caustic recuperators and washers.

In taking a check of over a year's operations, regarding the effectiveness of these Units as washers, we found the following:

One Unit has the efficiency in caustic removal from cotton fabrics equal to that of three average open boxes.

A number of installations using two Units in range have replaced to a more efficient degree standard five-compartment washers.

The removal of caustic from materials varies to a considerable degree in direct relation to the construction of the fabric. Taking as a basis, two-yard twills at speeds of 90 to 100 yards per minute, fabrics containing from 5 per cent caustic down to 1.50 per cent show the first Unit removing 75%-80% of total caustic and



Open Width Bleaching Range

The illustration shows units being used as saturators and washers.

The number of units to be used for any given operation depends on the speeds required, type of fabrics to be processed, and the efficiency expected from each operation. By the use of units in place of conventional open boxes, space is conserved and the number of motors and electrical equipment involved is reduced.

the second Unit removing 60%-70% of what was left after the first operation. One plant reports as an average 90 per cent caustic removal, using two Units at 200° F. running temperature, flowing 30 to 40 gallons of water per minute per Unit.

Such installations require less space, less mechanical upkeep, savings in steam and power, and a considerable decrease in fog and steam, due to such a small area of exposure of liquor and cloth surface to the atmosphere.

Dyeing Narrow Fabrics, Zipper Tape, Ribbons, Etc.

Continuous dyeing of narrow fabrics is being done at present on these Units to a decided advantage over skein handling. Small Units are being manufactured for this type of work. Simple mechanical continuous ranges that will process vats, naphthols, sulfurs, and direct colors show a decided advancement in this method of dyeing.

Warp Dyeing

New warp dyeing installations are in operation, using these Units. Most of this form of color application is still being studied, but indications are that such installations will have many advantages over existing mechanical layouts now in operation.

This Unit has added to the machines in use in the textile industry another mechanism which has proved its possibilities in the dyeing field, that will add greatly to the versatility of the standard equipment now in use.

Practical Laboratory Machine

Realizing, from the standpoint of servicing customers with reliable formulas and matches, it was important to have a small machine that would incorporate all the features of a large unit, we had a laboratory machine designed, built, and put in use for this purpose. By the use of this small model, we are now reinvestigating a number of color formulas and methods of reduction that could not be easily studied without this piece of equipment. Many production hours will be saved by plants investigating dye formulas and the dyeability of constructions, by using these small models. Application research may be carried out without tying up productive plant equipment.

The Williams Unit were offered to the textile industry by Morrison Machine Company during the latter part of 1944, and deliveries of these Units were started in 1945. At the time of this writing over 277 machines have been ordered and 170 delivered. We mention these dates to show that this piece of equipment is still relatively new. It will still take many years of operation to practically evaluate this Unit, covering all phases of its use.

The diagrams show where and how these Units may be used to an advantage.

Discussion

Question: What about the fixing of vat printed cotton goods on the unit?

Mr. Williams: A little work has been done along that line, but no conclusive results have been reached at this particular time.

Mr. Helmus: You mentioned a dryer between the pad and the reducing box in connection with cotton. What is your experience with viscose in that regard?

Mr. Williams: The average setups that are actually producing synthetics have no driers, with the exception of one plant. For the number of qualities that have been run to date we haven't found drying necessary on the majority of synthetic fabrics. However, on spun qualities containing acetate, I believe drying could be done to advantage over the handling of wet fabrics.

Question: Can you dye BCS type dyes on the Williams Unit at high temperature?

Mr. Williams: How dark?

Member: Medium shades.

Mr. Williams: Yes.

Question: In rubberized goods containing latex, either direct or vat dyes, have they been processed in the Williams Unit?

Mr. Williams; We, as yet, have made no tests on that particular construction.

Question: Did I understand you to say that stainless steel did not work out with certain chemicals used in those processes?

Mr. Williams: I mentioned that only because we are still studying the effect on various stainless steels with the continued use of strong acids in nitrite baths at elevated temperatures.

The SMO brands are recommended for use in acid baths, but with 24-hour operations within a plant, I still have my doubts that this steel will stand up in the presence of both acid and nitrite.

Question: Is there any other material superior to that in use?

Mr. Williams: We have found our best material ordinarily to be a rubber lined tank when using hot solutions of sulfuric acid and nitrite of soda.

Mr. Sutter: What do you think is the cause of some materials shading around the selvage?

Mr. Williams: We have seen very little of that. We have seen no shading caused by a failure of the Unit. The shading may be caused from the pad's not being properly set. We have seen cases where the moisture content in fabrics was not even in the piece before it was pigment padded and then when it went into the Unit, it was not in there long enough to level up that condition.

Question: You spoke about salt being present in the Unit. I am wondering if, in the medium shades, that salt would have to be added regularly. I am thinking now of vat reducing in the Unit on rayon where you have a bleeding off, and if I understood correctly you said salt may be added to help that bleeding off.

Mr. Williams: That is correct.

Member: My question then is how much and how often?

Mr. Williams: The baths should be charged, (to give you an average figure, on an easily soluble dyestuff of a medium shade and if the fabric is to have full retention of dyestuff) with a pound of common salt to a gallon of liquor and the same concentration of common salt put in the feed and fed into the machine throughout the dyeing operation.

Question: Will the Williams Unit correct facings on a piece that has gone through a padder?

Mr. Williams: We have seen a number of qualities and a number of dyeings that have been poorly padded that have been aided and corrected to a large degree by running through the Unit because you do get a terrific dyeing action at high speeds, but I don't think we could make the statement that poorly padded goods or badly faced goods would be corrected in all cases. I might give you an example of that. We have seen padded goods where the water dripped from the ceiling on to the material before it struck the Unit and that spot would be completely covered by the dyeing action in the Unit. Normally a water spot is a pretty hard spot to cover up when it drops on a pigmented material.

Question: In dyeing naphthols do you use your salt in the last compartment?

Mr. Williams: The Unit may be charged with the fast color salt, or you can use only the one well near the delivery nip. Your fast color salt or base is used there and is fed into that one well.

Question: Essentially, what is the principle of the Williams Unit? What does it depend upon? Does it depend upon the concentration? Just where does it differ from the other well-known types of machines for the other well-known types of dyeing?

Mr. Williams: Well, it varies mechanically and physically in that you are running a fabric down through a half-inch channel which gives a turbulent action of the liquor, and the volume of liquor that travels through that half-inch channel is choked at the bottom to a quarter-inch space. It produces the action of driving a volume of liquor from the

(Concluded on Page P274)

One Hundred and Fifty-Seventh

Council Meeting

THE COUNCIL held its 157th meeting in the Hotel Pennsylvania, New York, N. Y. on Friday morning, March 21, 1947. Present were President Henry F. Herrmann, presiding; John N. Dalton and C. Norris Rabold, Vice Presidents; William R. Moorhouse, Treasurer; Louis A. Olney, Chairman of the Research Committee; William D. Appel, William H. Cady, Carl Z. Draves and P. J. Wood, Past Presidents; Edward S. Chapin and George O. Linberg representing Northern New England; Howard V. King and Harold B. Sturtevant representing Rhode Island; George L. Baxter, Emmett J. Driscoll, Leonard S. Little, Harold H. Taylor and Winn W. Chase representing New York; Boyce C. Bond, Arthur W. Etchells, W. F. Fancourt, 3rd, Lloyd O. Koons and Percival Theel representing Philadelphia; Samuel L. Hayes, Raphael E. Rupp and R. Hobart Souther representing Piedmont; Kenneth H. Barnard, Chairman of the Convention Committee; J. Robert Bonnar, Chairman of the Executive Committee on Research; Harold W. Stiegler, Research Director; and Harold C. Chapin, Secretary.

The Secretary's report of the 156th Council meeting and financial report of March 13, and the Treasurer's report of March 17, were accepted. Reported approved through letter ballot by two thirds of the Council were bylaw amendments as follows—

Bylaw Amendments

For the first paragraph of Section 5 in Article X, substitute, "Each Section shall be represented in the Council of the Association by at least one Councilor, elected by the Section to take office on the January first next following his election; and for its total proportionate representation as provided in the Constitution, a Section shall be allowed during the twelve months following each January first, one Councilor for each one hundred and fifty Senior members or fraction thereof in good standing on the May first next preceding said January first, up to the total of five Councilors for total of 601 Senior members; plus an additional Councilor for bringing the total to 801 Senior members, another for 1101 Senior members, another for 1501, and so on with like increasing increment of membership for each additional Councilor."

In Article IV, add to Section 1, "a Committee on Conventions, and a Committee on Technical Programs."

To Article IV, with appropriate renumbering of existing Sections, add—"Section 9: The Committee on Conventions, appointed by the Council, shall act in a purely advisory capacity to the Council, and to local Sections, on the management of conventions. Within one month of the closing of each convention, the Convention Manager appointed by the local Section shall render in duplicate to the Chairman of the Convention Committee a full report on the management of that convention, other than arrangement of Technical Program provided for in Section 10, at the same time sending a third copy to the Secretary of the Association.

"It shall then be the duty of the Chairman of the Convention Committee to prepare comments and suggestions for submission to the Council and filing with the Secretary. Copies of all reports in the files of the Convention Committee shall be available to each Convention Manager upon his appointment, but shall be returned to the Convention Committee within one month of the end of the convention.

"Section 10: The Committee on Technical Programs shall be appointed by the Council. It shall be the duty of this committee to arrange and have supervision over the technical program of each national convention of the Association, with the aid and advice of the local Section or Sections under whose auspices the convention is held. Arrangements for space and facilities shall be made entirely by the local convention committee.

"Within one month of the closing of each convention, the Chairman of the Committee on Technical Programs shall file in duplicate, with the Secretary of the Association, a corrected list of the speakers and papers actually presented."

Other Business

Investments made by the Appropriations Committee, and the further investment of $500, received toward the Olney Medal Fund, were approved. An appropriation was made to purchase reprints of the old Colour Index for resale, pending publication of the new volume. It was voted that $7.50 from each Corporate membership fee be appropriated for the general expenses of the Association in connection with Corporate memberships, to accord with new Senior and Associate membership fees. The President was authorized to appoint a committee to report at the next meeting on a full-time Secretary from August first, and a committee to consider the Association's problems in providing test materials, etc. for sale.

Committees Appointed

Committees were appointed as follows—

Membership: J. N. Dalton, *Chairman;* C. N. Rabold and H. C. Chapin, *members ex officio.*

Inter-Society Council for Textile Research: J. R. Bonnar, *representative;* L. A. Olney, *alternate.*

Corporate Membership: E. J. Driscoll, *Chairman;* F. L. Bume, *New York Section;* M. H. Gurley, Jr., *Northern New England Section;* F. C. Scholler, *Philadelphia Section;* S. M. Cone, *Piedmont Section;* A. K. Haynes, *Southeastern Section;* K. J. Broden, *Rhode Island Section;* H. A. Rodgers, *South Central Section;* Samuel Klein, *Mid-West Section.*

Publicity: W. W. Chase, *Chairman;* W. D. Appel, K. H. Barnard, C. W. Bendigo, G. B. Chabot, Jr., H. F. Herrmann, N. A. Johnson, H. E. Millson, A. J. Nelson, L. A. Olney, A. E. Raimo, J. C. Shore, A. R. Thompson, Jr., H. M. Waddle, and H. E. Wieland.

Conventions: K. H. Barnard, *Chairman;* B. C. Bond, E. J. Driscoll, S. L. Hayes, G. O. Linberg, and R. W. Philip.

Technical Program: M. A. Dahlen, *Chairman;* K. H. Barnard, Herman Boxer, F. Dannerth, S. Jack Davis, H. E. Hager, W. J. Hamburger, Samuel Hayes and R. W. Jacoby.

Research Committee: L. A. Olney, *Chairman;* others reappointed.

Executive Committee on Research: J. R. Bonnar, *Chairman;* H. F. Herrmann, W. D. Appel and L. A. Olney, *ex officio;* L. S. Little and S. L. Hayes.

Appropriations: W. R. Moorhouse, *Chairman;* H. C. Chapin, C. Z. Draves, L. A. Olney and P. J. Wood.

Publications: L. A. Olney, *Chairman;* W. H. Cady, H. C. Chapin, W. W. Chase, C. Z. Draves, and N. A. Johnson.

Constitution and Bylaws: H. C. Chapin, *Chairman;* C. Z. Draves and W. R. Moorhouse.

Colour Index: L. A. Olney, *Chairman;* W. D. Appel, W. C. Bainbridge, J. R. Bonnar, W. H. Cady, H. M. Chase, A. F. Clark, J. L. Crist, R. E. Derby, F. R. Haigh, R. W. Jacoby, E. R. Laughlin, W. R. Moorehouse, A. Morrison, R. W. Powell, T. R. Smith, B. M. Van Cleve, W. von Bergen and P. J. Wood.

Reports

Reports were received from the Research Committee, Executive Committee on Research, Corporate Membership Committee, Publicity Committee, from Mr. Linberg on the Boston convention, and by letter from Mr. P. J. Kennedy on the Inter-Sectional Contest at the coming convention in Chicago on October 23 to 25, 1947. A decision, at the President's suggestion that the next meeting of the Council be in Washington, was later changed with the approval of Southern members to a Council meeting in New York on June 6, because of the International Textile Exposition in that city. The Council reconvened in the afternoon to approve the recommendation of the Research Committee that the procedure involving the Flammability Tester be reported to the National Bureau of Standards as a standard method of the Association.

Members Elected

Elected to Corporate membership were Aetna Color and Chemical Co., Bear Brand Hosiery Co., Dean and Sherk Co., Real Silk Hosiery Mills, Textile Industries, and the United States Dyestuff Corporation. Each of the following was elected to the class of membership specified, as of thirty days from publication of application, provided no objection be received meanwhile by the Secretary.

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E. Eismann
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D. T. Hatton
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J. D. Honeycutt
H. G. Houlton
E. Hultman
S. I. Hunter
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I. Jacobs
R. E. James
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J. B. Johnson
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E. Kahn
J. Kane
S. G. Kaplan
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H. N. Knight
S .E. Korpanty
E. B. Laughlin
E. T. Laughlin
P. R. Lindsay
N. Lynn
H. B. Madeen
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T. H. McCamy
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J. D. Parikh
J. Peterson
W. H. Schlegel

(Concluded on Page P276)

SECRETARY'S FINANCIAL REPORT—MARCH 13, 1947

	Applications	Dues, regular & reinstate	Dues, Corporate & Sustaining	Miscellaneous	Totals
Received & transmitted to Treasurer					
August 1 to Dec. 4, 1946.....	1,662.00	21,022.00	580.00	4,262.25	27,526.25
Dec. 4, 1946 to Mar. 13, 1947..	1,895.50	7,699.00	32,895.00	11,308.73*	53,798.23
Total in fiscal year.....	3,557.50	28,721.00	33,475.00	15,570.98	81,324.48
Leaving deposited by Treasurer with Secretary.....					2,000.00

* Miscellaneous items		
Dividends		244.80
Quartermaster contract		4,513.90
C.W.S. contract		2,895.90
Boston convention registrations, net		1,297.69
Olney Medal fund		500.00
Launderometer royalties		210.00
Flammability tester royalties		168.00
Water test apparatus		138.50
Crockmeters		368.00
Crock cloth		105.70
Dyed standards		47.86
Reporters		56.10
Reprints		48.25
Color transfer charts		91.00
Multifiber cloth		60.00
Knitted tubing		27.30
Moth cloth		142.50
Buttons		26.00
Gas fading units		51.00
Year books		310.27
Rebate on apparatus returned		7.09
		11,309.86
Less bank charges		1.13
		11,308.73

The Production of Fast Shades on Mixed Fibers—

Dyeing of Fast Shades on Piece Goods

*Containing Cotton or Viscose Rayon Mixed with Wool**

L. S. THOMPSON

General Dyestuff Corp.

THE so-called intuitive or haphazard dyer, or whatever else he may have been called, is now generally recognized to be a relic of the bygone days. This has been brought about in part by the many blends and constructions of fabrics with which the present day dyer must be fully familiar. Blends of animal, vegetable and synthetic fibers have usually been dyed with selected direct and acid colors. For many types of wearing apparel direct and acid colors do not meet the fastness requirements and for this reason vat colors are finding an increasingly greater use.

Spun rayon-wool fabrics are woven with varying percentages of wool, ranging from as low as 15% to as high as 50%; usually blended both warp and filling.

It is well known that defects in piece goods which have their origin in the spinning or weaving rarely ever become apparent until the dyeing stage is reached and then generally manifest themselves by unevenness. The blame for these defects is always attributed to the process in which they are detected; namely, the dyeing operation.

Preparing the Material

To enable a distinction to be made between different lots of yarn or between very similar yarn qualities, or between right and left twists, it is common practice for spinners or weavers to sight yarn slightly heavier than is necessary, and for this reason care must be taken in the first step of preparing the material prior to dyeing. Frequently the sightening colors are dyestuffs that are normally used for the dyeing of wool and it would be only a natural reaction that when subjected to water at temperatures above 110° F. these dyestuffs would dye or stain the wool to such a degree as to require an additional operation for their removal, namely, stripping with hydrosulfite.

It is therefore recommended that the first treatment of all spun rayon, cotton and wool mixtures, whether it be continuous scour or dye beck be conducted at a temperature not exceeding 100° F. and preferably at 80° F.

Most of the fabrics woven with mixtures as mentioned, contain a starch sizing as well as sightening color, both of which must be completely removed to insure a final result which is uniform in shade, satisfactorily penetrated and finished with a crisp woolly hand which is not boardy. When scouring in the dye beck the dry material should be entered at about 80 to 90° F. and run at this temperature for fifteen minutes to remove the sightening color. A fresh bath is then made up with ½% of desizing agent ½% of a synthetic detergent (based on weight of material) which does not effect the enzyme and allowed to run for about 15 minutes at 140° F. until the desizing is completed. Then providing the bath is free of sightening color, ¼% soda ash (based on weight of material) is added to the dye beck and the temperature then brought up to 160° F. This operation is continued for about 20 to 40 minutes when the material is then rinsed clear with warm water.

Use of Direct Colors

For the dyeing of solid shades on spun rayon-cotton and-wool mixtures, a selected group of direct colors are available. A number of these colors when dyed under proper conditions in light shades will pass a 40-hour Fade-Ometer test, and AATCC rayon wash #1. Unfortunately many of these direct colors which dye a uniform or solid shade on these fibers are not fast to light especially in light shades, nor do they have good fastness to wet processing in medium and heavy shades. It is however, often possible to increase the wash fastness with a suitable aftertreatment, such as formaldehyde, bichromate of soda or both.

In view of these facts, there has been a definite demand in the trade for fabrics of this class which will stand more stringent fastness requirements. The only dyestuffs which will meet such requirements are vat colors, their leuco esters, and possibly naphthols.

Application of Vat Colors

The vat colors are applied by one of the following methods:

1. Reduced pad, followed by re-reduction.
2. Pigment pad, jig reduced.
3. Pigment pad, reduced continuously.
4. Vat acid pad, reduced continuously or on the jig.

For the dyeing of light shades, the reduced-pad, re-reduced method has been used successfully in continuous operation on standard booster box equipment at conventional temperatures, or more recently on the William's Unit for shorter periods of time at more elevated temperatures, using in the padding liquor a protective colloid and ½ to 1 oz. caustic soda and hydrosulfite per gallon. The quantities of alkali and hydrosulfite will vary according to the depth of shade being dyed. The reduction bath should contain, in addition to a protective colloid, ½ to 1 oz. caustic soda and hydrosulfite each per gallon. The temperature of this bath is usually no higher than 130° F. to 150° F.

For the dyeing of heavier shades the application according to the pigment pad-jig method is recommended; the padding liquor containing ¼ oz. Nekal BX per gallon is made up at 140° F. After padding, the batched roll is transferred to the jig for reduction. In view of the fact that we are dealing with animal fiber, it is essential to maintain a temperature no higher than 120° F. in the jig. In order to effect some protection of the wool, it is advisable to add a protective colloid, such as glue, 2 to 3 lbs. per 100 gallons being sufficient.

The quantity of caustic soda in the reduction bath is usually much less than

* Presented at meeting, Piedmont Section, January 25, 1947.

would normally be used on all vegetable fabrics while the quantity of hydrosulfite is increased. Plant practice has indicated that practically no damage results to the animal fiber by running four to six ends in reduction.

It is most important that a good guide be established on the initial dyeing of a new shade. Insofar as has been mentioned, a maximum of four to six ends on the jig for developing is most important.

On completion of reduction, two running cold water rinses are given, and oxidation conducted with hydrogen peroxide and acetic acid. It is important that all the alkali be neutralized prior to soaping. This method of oxidation normally yields the brightest shade of the dyestuff in use.

It is well to remember that the jig roll must be kept in motion at all times throughout the reducing and washing operations as a safeguard against uneven oxidation.

Another pad-jig method for developing is by the use of trisodium phosphate, 4-8 oz. per gallon plus 6/10 oz. per gallon of glucose, ¼ oz. per gallon of a protective colloid and 1 oz. per gallon of sodium hydrosulfite at a temperature of 140° F. Selected colors must be used, namely, those which yield a complete reduction by this method.

Practical trials already made have indicated that quality work can be performed with these blends by padding the pigment in the usual manner and conducting the reduction operation continuously in the William's Unit. The same precautions as previously mentioned must be taken, namely, the use of a protective colloid and minimum quantities of caustic soda. It is not as yet possible to make use of the high reduction temperature usually employed when dyeing all vegetable fibers by this method. Temperatures of 150 to 160° F. have been found satisfactory.

Many trials by the vat acid process have been made and practical use of this method has found acceptance. The same advantages found when using this method on cotton fabrics hold for the dyeing of blends, namely, speedier conversion to the sodium leuco, and covering of mill imperfections. The general method of application of the vat-acid process is similar to the pad-jig pigment pad method. The finer dispersion of the vat-acid assists penetration which results in a more even dyeing. This method also assists dyeing of blends through the use of milder alkalis, such as tri-sodium phosphate. Inasmuch as the vat-acid is more readily converted to the sodium leuco, this better penetration also produces in many cases improved fastness to washing on the protein fiber. This method becomes of increasing importance as the wool content increases, such as in spun rayon-wool, 60/40 blends. The vat-acid method is limited at the present time to the dyeing of light to medium shades.

Application of Leuco Esters

The Algosols, or leuco esters of vat dyes, are of great value in the production of fast to light shades on spun rayon wool mixtures. Their ease of application and adaptability to continuous methods have increased this interest to the present era of streamlined production. They are usually applied by the continuous method, using in the padding liquor ½ to 1 oz. per gallon sodium nitrite, and developed by running through 1 to 2% by volume of sulfuric acid 66°Bé, at temperatures ranging from 120° F. to 160° F. Neutralization and soaping follow in continuous operation. The pad-jig method may also be employed but the continuous method is preferred where equipment of this kind is available because of the action of nitrous acid on the animal fiber, this action being accentuated in the jig operation.

The action of nitrous acid on protein fibers produces a yellow coloring matter which has very poor fastness to light. This yellowing, however, can be considerably eliminated by a subsequent treatment with 1% sodium bisulfite at a temperature of 200° F.

In blends containing more than 20% of wool, the shade change on exposure to light after 20 hours is quite pronounced, therefore, a modification in the method of oxidizing is required. It has been found that by the use of 1% ammonium persulfate and 1% sulfuric acid, based on volume, satisfactory results can be obtained.

In view of the differential in cost between vat dyestuffs and their leuco esters, the use of the latter is usually confined to the dyeing of light to medium shades.

Selection of Dyestuffs

Selection of dyestuffs is of considerable importance in the production of satisfactory unions. It has been found that Blue GDC types are much more suitable than Blue BCS brands. Nevertheless as we increase the depth of the dyeing even with this type of blue, we frequently find that the animal fiber is lighter than the spun rayon. For the production of medium shades of blue, we have found that most satisfactory unions are obtained by replacing part of the Blue GCD with Navy Blue BRP adding Indanthrene Brilliant Green BN Pure Double Paste to obtain the required brightness.

Generally speaking, dyestuffs of the warm dyeing or even cold dyeing classes are better adapted for the dyeing of such blends chiefly because they require less alkali for reduction. This does not provide us with a complete range of shades, and as a consequence, we must in many instances, resort to the use of the hot dyeing colors. As a class it has been found that all violanthrene types yield good union effects. Examples are:

Indanthrene Brilliant Violet 2RA-4RA
Indanthrene Direct Black RBA
Indanthrene Brilliant Green BN Pure Double Paste
Indanthrene Navy Blue types
Indanthrene Dark Blue BOD

It is frequently found that the shade of the respective vat dyestuff on wool varies somewhat from the shade on spun rayon. This does not present any particular problem because a study of this variation soon enables the dyer to make mixtures of types which will counteract the shade difference on the two fibers.

Use of Naphthols

It is fitting at this time to mention the work that is being carried out experimentally on wool and spun rayon mixtures with naphthols.

Laboratory investigation has shown that union shades can be dyed by reducing the caustic soda to a minimum and by the addition of trisodium phosphate or similar inorganic alkalies, a stable naphthol solution is obtained.

The naphtholating bath should have a pH of 10, the impregnation temperature being the one recommended for the particular naphthol in use to insure an even coverage of the rayon and wool.

As a precaution against the staining of wool the devoloping bath should be made with the addition of acetic acid buffered with sodium acetate.

It has been our purpose in this paper to show some of the practical work which has been done on the dyeing of spun rayon and wool blends.

This has shown that a great deal of progress has been made in the use of faster colors for these blends. It is expected that the demand for this class of work will increase with the recognition by the general public of the value of improved fastness.

Recently published data and further anticipated developments in our knowledge of the action of various chemicals on the protein fiber together with improved dyestuffs give promise of future interesting developments.

The Production of Fast Shades on Mixed Fibers—

The Dyeing of Fast Shades on Piece Goods

*Where Nylon and/or Acetate are in Mixtures Containing Wool**

H. F. CLAPHAM and G. R. TURNER

E. I. duPont de Nemours & Co., Inc.

THIS paper will discuss briefly the dyeing of fast shades on piece goods where nylon and/or acetate are in mixtures containing wool. The subject is certainly timely, since production of cut staple nylon is proceeding apace. At a meeting of the New York Section in December, Dr. Larson of the Nylon Division of the DuPont Company spoke on nylon staple fiber and stated that early in 1947 limited commercial production was expected of nylon staple fiber. Currently, pilot plant operations are producing staple fibers of 1½, 3, 6, 10 and 15 denier filament in cuts of 1 to 5 inches. The properties which he outlined in his paper make the fiber sound extremely attractive for blends with wool. It was stated, for example, that for each percent of three denier nylon staple blended with wool in yarn, the strength of the yarn will be increased 4%. In other words, a blend of 75% wool and 25% nylon staple fiber would be twice as strong as an all wool yarn of the same size.

There is one little joker in the subject of my paper, and I rather suspect that the people who decided on the title had their tongues in their cheeks when they put in "and/or acetate"—but more about that later.

A great deal of work has been done in the laboratories and in the mills in this country on the dyeing of nylon and nylon-wool mixtures to obtain the best possible fastness to both light and washing. Many problems still remain to be solved to produce the ultimate in fastness which such high-quality, long-wearing fabrics deserve. The introduction of spun nylon or nylon staple fiber will ease greatly the problems of dyeing which have been encountered in the dyeing of filament nylon materials.

Dyeing Properties of Nylon

Perhaps a few words about the dyeing properties of nylon will be helpful in understanding the problems. As you may know, nylon can be dyed with practically all classes of dyestuffs, including acetate, acid, premetallized, chrome, direct, diazo and vat colors. However, the fastness properties of the resulting dyeings on nylon cannot be predicted from the fastness properties of the same colors on more conventional fibers. For example, vat colors which are well-known for their extreme light fastness on cotton, in general show relatively poor results on nylon. Types which may show as much as 150 or 200 hours light fastness on cotton, in the Fade-Ometer, will show perhaps 15 or 20 hours fastness on nylon. This makes it obvious that an entire new background of fastness information must be developed before suitable colors can be selected for use on nylon. Added to the problems of color selections from a fastness viewpoint, there are the problems of covering junctions, which apply particularly to filament yarn in hosiery, the selection of colors to minimize blocking effects, which is particularly important in heavy shades where one dyestuff may completely block off the other in a combination resulting in an entirely unexpected shade effect, and the problem of dye saturation of the fiber, where it becomes impossible to build up sufficient color on the fabric to make the depth of shade required. With spun nylon fabrics, the problem of junctions does not arise, since blending, which occurs during the manufacture of the yarn, decreases any such difficulty. The blocking effect and saturation point, however still remain, and careful color selection is necessary to obviate these troubles.

In general, it might be stated that for uniform dyeing and ease of application, acetate dyestuffs offer the most satisfactory results on nylon. They are, however, seriously deficient in wash fastness, although with selected types satisfactory light fastness can usually be obtained. It has been found that acid dyes, premetallized dyes, and certain selected direct dyes offer the best all-round fastness to light and washing. There are limitations on their use, however, because of their poor leveling and junction covering and blocking properties.

Since acetate rayon fiber also enters into this discussion, I would like to mention, as you probably all well know, that the acetate dyes are the only satisfactory types at present available for dyeing of this fiber.

After this brief acquaintance with nylon and its specific dyeing peculiarities, we will proceed to the subject of this paper and to what will, perhaps, be one of the most important blends of nylon; wool-nylon fabrics.

Wool-Nylon Fabrics

Considerable experimental as well as some practical work has been done on this blend of fibers. In order to obtain the ultimate in fabric properties, it has been recommended that the first step in processing be a thermosetting treatment. This is accomplished by subjecting the fabrics to either dry heat, or saturated steam pressure for a short period of time. Twenty-five pounds positive steam pressure for 30 minutes or hot air at 450° F. for 67 seconds have shown good results on spun nylon fabrics. This treatment exerts a fundamental influence on the character of the fabric imparting a soft, desirable hand, better draping properties and more life and character. Properly set nylon fabric has much greater ability to recover from wrinkling, as well as increased dimensional stability, which precludes difficulties due to shrinkage during washing or changes in shape during wearing. Following the thermosetting operation, the fabric should be thoroughly scoured to remove all dirt and oil prior to dyeing.

For the dyeing of wool-nylon unions, careful color selection is necessary since both wool and nylon have affinity for the same type of dye. In many cases, with single dyestuffs, it is possible to obtain good union on both fibers by minor variations of the dyeing method; however, it is not necessarily true that these dyes will still produce a good union when

* Presented at meeting, Piedmont Section, January 25, 1947.

dyed in combination with each other. This, of course, is a manifestation of the well-known "blocking-off" effect previously mentioned.

To my knowledge, there is no way at present to predict which dyes will and which will not cause "blocking-off," except by the trial and error method. The optimum method for overcoming this effect is to select combinations of dyestuffs that dye at the same rate and penetrate the fiber to the same degree. Obviously it is not always possible to approach your dyeing problem with such dyes as these, and a further method of circumventing the problem of a poor union due to "blocking-off," is to enter an additional dye into the combination with the opposite effect to the one causing the trouble.

Without going into dyestuff selection at this point, I have here two exhibits that demonstrate fairly clearly the effects and remedies I have just described.

In the first case, a yellow, red and blue were combined to produce a given shade. Incidentally, each of these dyes produces a fairly good union on both fibers by itself. As you can see, we do not have a very satisfactory union. On the other hand, by changing our selection of dyes, we can produce a similar shade and at the same time obtain a satisfactory union.

As an illustration of the second method of producing a good union, we have added a fourth color to the combination which corrects the off-shade effect.

These examples, by the way, were all made up with fast-to-light acid dyes. The same effect is shown with premetallized dyes as well as direct dyes and milling dyes. As a matter of fact, we have illustrated dyestuff behavior on wool-nylon mixtures representative of all dyes which dye on both fibers.

It is neither practical or possible in this brief paper to develop specific dyestuff formulas which will be satisfactory for any and all problems in connection with the dyeing of these fiber mixtures. However, a brief general discussion of each group of dyes may be helpful.

Discussion of Various Dye Groups

Level dyeing acid dyes should be applied from an organic acid bath such as formic or acetic acid rather than from sulfuric acid. Laboratory work to date indicates that sulfuric acid has a rather marked deleterious effect on nylon, and should be avoided. The use of Glauber's salt is not especially desirable for dyeing nylon; however, inasmuch as we are dealing with wool-nylon blends, its use may be warranted, although excessive amounts should be avoided.

It is well known that these dyes possess good transfer properties on wool, and, of course, even in the presence of nylon transfer will take place. Nylon introduces a new condition, however, since these dyes will not transfer from nylon. On the other hand, any color which transfers from the wool will be practically taken up by the nylon thus introducing a new variable into the dyeing procedure. The one limiting factor here is the saturation value of the nylon. As a matter of fact, if the usual transfer test is carried out by the addition of undyed material to the bath after regular dyeing, you will find that the original dyed wool will lose very considerably in depth, while the original dyed nylon is relatively unchanged.

Temperature and time of dyeing are also factors but suffice it to say the higher the temperature and the longer the time, the better dyeing that will be obtained on the nylon. All of these factors can be varied as required to help in solving specific problems.

The milling acid dyes follow the same general pattern as the level dyeing types. Dyeing can be carried out with a weak acid such as acetic, or an acid salt such as ammonium sulfate or acetate. Dye transfer does not enter the picture with these colors, and obviously every usual precaution necessary for uniform color application should be taken.

The "Chromacyl," or premetallized dyes, react in much the same manner as the level dyeing acid dyes, and the same general factors as previously described hold true. In view of the detrimental effect that sulfuric acid has on nylon, its use should be avoided.

Chrome colors, of course, present the problem of obtaining complete lake formation on the nylon without overchroming the wool. Our experience in the laboratory has shown that certain blends of wool-nylon dye and chrome quite readily, while others require very severe conditions. The factors to be borne in mind are that an average amount of chrome, at fairly low pH values, for periods of about an hour at the boil, represent the best conditions for lake formation on both fibers in the blend. If chroming under these conditions is not sufficiently complete on the nylon it will be best to consider another dye combination.

Bottom chrome and chromate dyeing have not as yet proved successful for nylon dyeing, and these cannot be considered for wool-nylon blends.

In summation of this phase of our subject, it can be said that the "Chromacyl" type dyes are the most satisfactory for use on wool-nylon blends for ease of application, color formulation, and both light and wet fastness properties. Neutral dyeing fast-to-light acid dyes, such as the various anthraquinone blues, anthraquinone rubine, and cyanine green are also quite satisfactory for all-round fastness properties and dyeability.

Generally speaking, most of the wool dyes have light fastness on nylon about equal to that on wool, and wet fastness at least equal to that on wool.

It is worth repeating that proper color selection is of prime importance for the production of a good union on wool-nylon blends, and that the changing of the blend in any respect may upset the dye formula completely and necessitate a complete revision.

Wool-Acetate Unions

Wool-acetate unions present a much more difficult problem from the fastness point of view. Basically, the principle of dyeing the acetate with acetate dyes and the wool with neutral dyeing acid dyes must be followed. However, acetate colors show considerable affinity for wool and usually stain it rather heavily. This stain not only causes dulling of the wool component, but also the stain on wool is not fast to either light or washing, resulting in relatively poor fastness on these fabrics. The problem resolves itself into the selection of acetate dyes which show the least stain on wool, having adequate fastness on the acetate for the ultimate use of the fabric, coupled with neutral dyeing wool colors, of saisfactory fastness, to fill up the wool.

Wool-Nylon-Acetate Unions

Wool-nylon-acetate unions present an even more difficult problem. Necessarily, acetate dyes must be used for the acetate fiber. These not only stain the wool, as previously mentioned, but also dye the nylon to full shades. To complicate the picture, however, in many cases they do not dye nylon the same shade they dye acetate so that a union between even these two fibers presents a serious problem. When you start to fill up the wool with neutral dyeing acid types further dyeing takes place on the nylon throwing it still farther off shade. If such a fabric is presented to you for dyeing, my only suggestion is to go into the laboratory and experiment to find a suitable mixture of acetate and neutral dyeing acid colors to obtain the union. It is my personal opinion, at this time, that such a mixture should be avoided at all costs and that acetate only be incorporated into wool-nylon mixtures as an effect thread where it could be left undyed.

(Concluded on Page P274)

The Production of Fast Shades on Mixed Fibers—

Dyeing of Yarn Blends

Containing Wool as One Component*

ORMOND W. CLARK

Calco Chemical Division, American Cyanamid Company

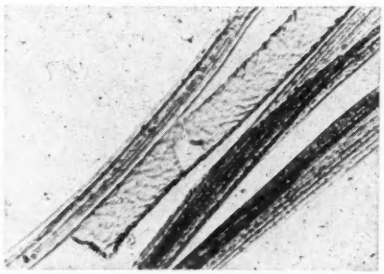
Introduction

WHEN the production of a range of fast colors on a yarn blend containing wool as one component is undertaken, the dearth of reliable information about practical methods suitable for American dyehouse operations quickly becomes evident. A limited amount of information has been available in the literature, but it usually involved the use of special types of dyes or the maintenance of very delicate chemical balances in the dyebath. This very brief discussion makes no pretense at filling the void, but a few of the more interesting facts which have developed during experimental work in the Calco laboratories will be discussed and they may perhaps serve as a starting point for those who wish to experiment further on specific problems.

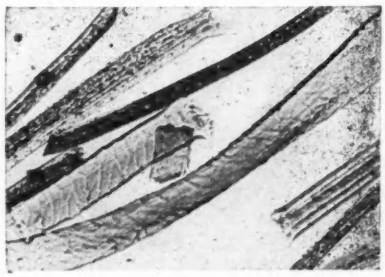
To the dyer who has not previously had experience with wool, its introduction into various blended yarns brings new and sometimes unanticipated difficulties. The wool fiber is sensitive to heat, alkali, many other chemicals, and to mechanical manipulation. It does not absorb dyes as quickly as cellulosic fibers and the latter often rob the wool of its normal share of dye. Wool from different sources may vary widely in dyeing behavior. Portions of the wool fiber which have been damaged, such as the tips of fleece which have been constantly exposed to sun and weather, may dye differently than undamaged wool.

The removal of oil from wool, both that natural to the fiber and that which has been added to facilitate manufacturing processes, is usually necessary and not always easily accomplished. At present, the shortage of vegetable and animal oils leads to their frequent replacement by mineral oils for lubrication of the fiber, and these latter oils may present unusual difficulty in removal. Wool which appears in yarn blends has usually been scoured in stock form before fabrication into yarn and the oil content is usually less than 2%. If the yarn is in skein

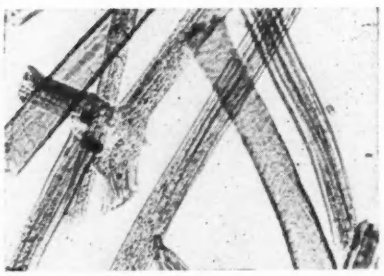
* Presented at meeting, Piedmont Section, January 25, 1947.



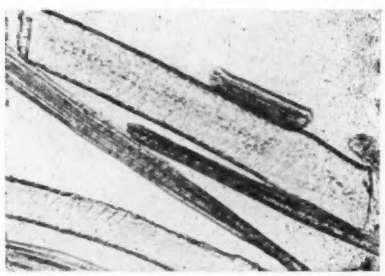
Slide 1
Calcoloid Pink FFD
Ammonia Method



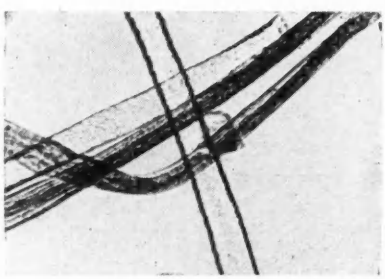
Slide 2
Calcoloid Pink FFD
Caustic Soda Method



Slide 3
Calcoloid Pink FFD
Trisodium Phosphate Method



Slide 4
Calcosol Red BN
Ammonia Method



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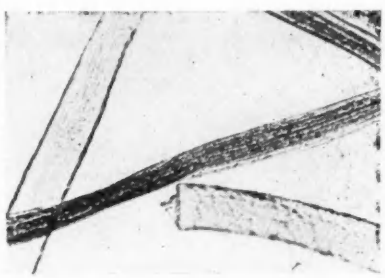
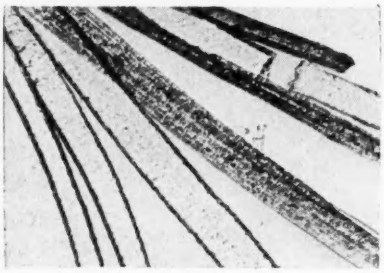
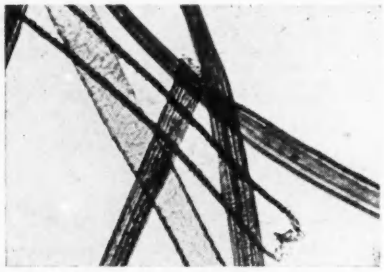
Calcosol Red BN
Caustic Soda Method



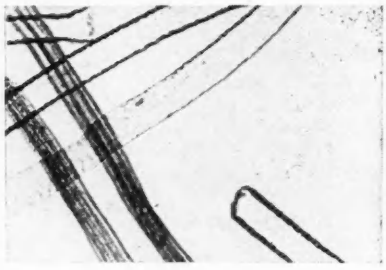
Slide 6
Calcosol Red BN
Trisodium Phosphate Method



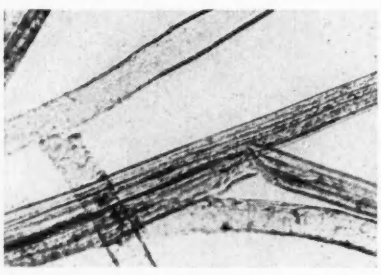
Slide 7
Calcosol Brown BR
Ammonia Method



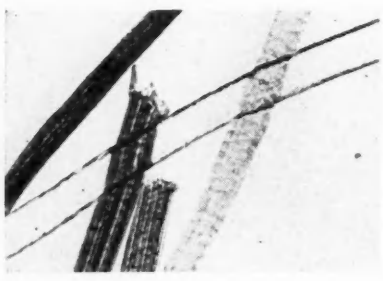
Slide 8
Calcosol Brown BR
Caustic Soda Method



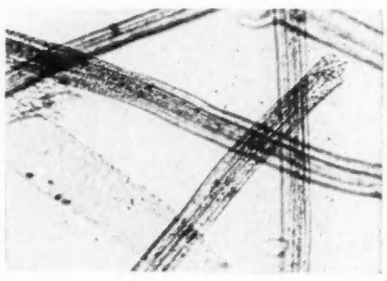
Slide 9
Calcosol Brown BR
Trisodium Phosphate Method



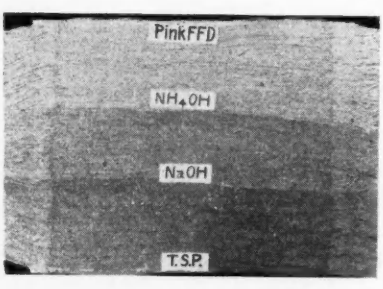
Slide 10
Calcoloid Blue BLD
Ammonia Method



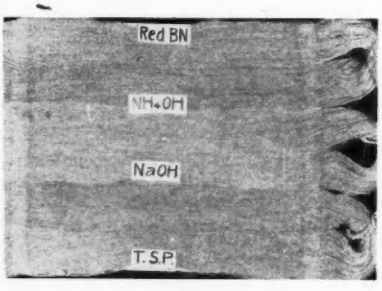
Slide 11
Calcoloid Blue BLD
Caustic Soda Method



Slide 12
Calcoloid Blue BLD
Trisodium Phosphate Method



Slide 13
Calcoloid Pink FFD



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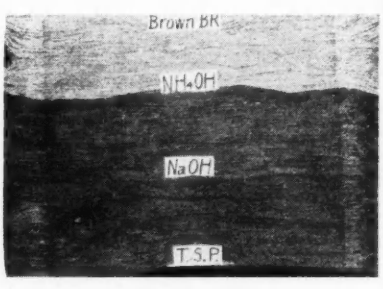
Calcosol Red BN



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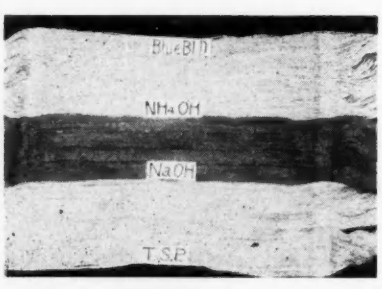
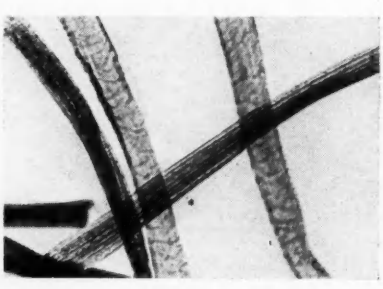
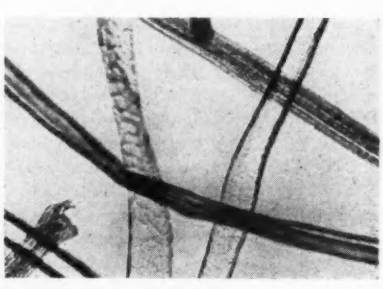
Calcosol Brown BR



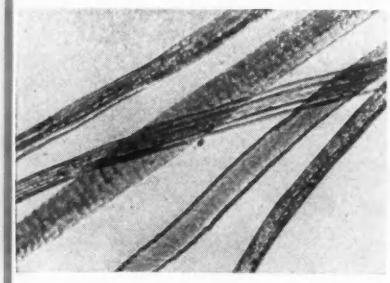
Slide 16
Calcoloid Blue BLD



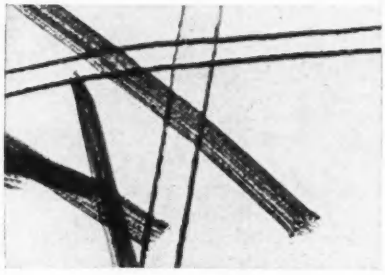
Slide 17
Calsocol Violet RK



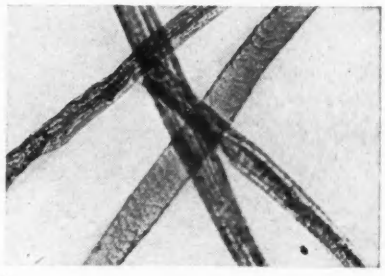
Slide 18
Calcosol Violet BN



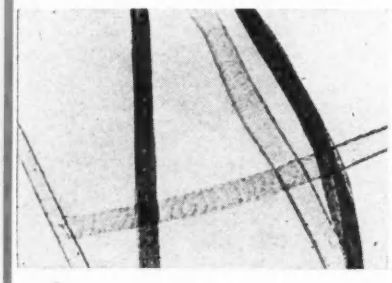
Slide 19
Calcosol Olive R
With Sodium Stannate



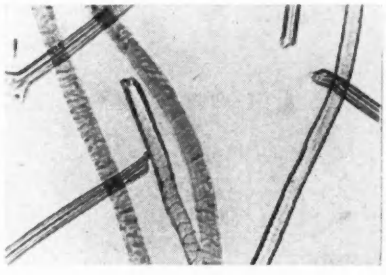
Slide 20
Calcosol Olive R
Without Sodium Stannate



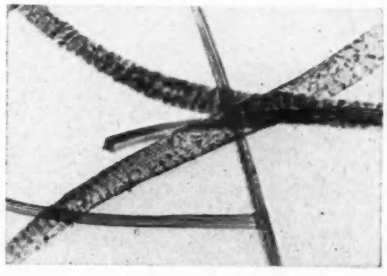
Slide 21
Calcoloid Blue BLD
With Sodium Stannate



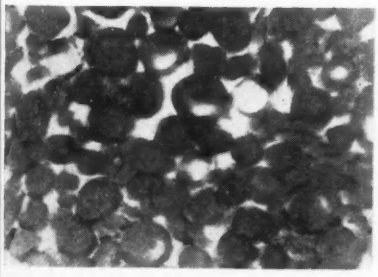
Slide 22
Calcoloid Blue BLD
Without Sodium Stannate



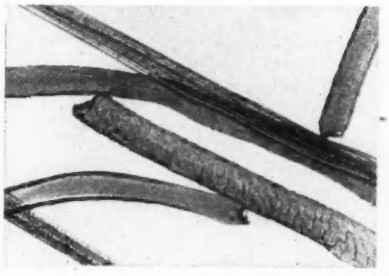
Slide 23
Calcoloid Brown R
Without Aerosol C61



Slide 24
Calcoloid Brown R
With Aerosol C61

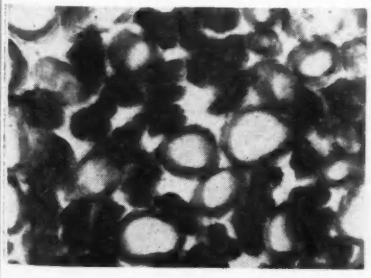


Slide 25

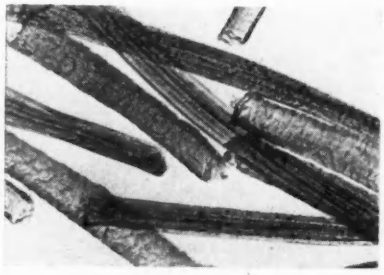


Slide 26

Napthol AS-TR + Fast Orange Salt GC



Slide 27



Slide 28

Napthol AS-SW + Fast Scarlet Salt GG

form, a scouring treatment at 120° F. with a synthetic detergent and a small amount of ammonia usually removes most of the oil and wets out the yarn adequately. In package form, the yarn may be difficult to clean properly due to the tendency of oil and dirt to concentrate at the outer and inner surfaces of the package.

The wool fiber swells only very slightly and the pore size undergoes very little enlargement below 140° F. and hence absorption of dyes below this temperature is often rather slow.

The accompanying slides illustrate some aspects of the behavior of fast dyes when applied to blended yarns containing wool and viscose.

The first 16 slides show 4 different vat dyes. Three dyeing methods were used:

1. The Ammonia-Sodium Lignin Sulfonate Method.

2. The Caustic Soda-Sodium Lignin Sulfonate Method.

3. The Trisodium Phosphate-Sodium Lignin Sulfonate Method.

Calcoloid Pink FFD was applied at 113° F. by the Ammonia Method as recommended for dyes in Group I in the Appendix.

Calcosol Red BN was applied at 140°

F. by the Ammonia Method as recommended for dyes in Group II in the Appendix.

Calcosol Brown BR was applied at 165° F. by the Ammonia Method as recommended for dyes in Group III in the Appendix.

Calcoloid Blue BLD, not included in the list in the Appendix, was dyed at 140° F. by the Ammonia Method.

All dyeings by the Caustic Soda Method and by the Trisodium Phosphate Method were made at 140° F.

Slides 17 and 18 contrast Calcosol Violet RK, a good union dye for wool-viscose and Calcosol Violet BN, a poor union dye for wool-viscose.

Slides 19, 20, 21, and 22, illustrate the improved union secured when sodium stannate is added to the dyebath when using selected dyes on wool-viscose.

Slides 23 and 24 show the improved union secured when wool-viscose yarn is pretreated with Aerosol C61 and then dyed with selected dyes.

Slides 25, 26, 27, and 28 represent azoic dyes applied to wool-viscose yarn with the assistance of sodium lignin sulfonate in the naphthol bath.

Slides 29 and 30 represent sulfur dyes applied to wol-viscose yarn at 140° F. with the assistance of sodium lignin sulfonate.

Slides 31, 32, 33, and 34 represent soluble vat dyes, also known as Indigosol or Algosol dyes, applied to wool-viscose yarn by two methods, the cotton method and the wool method.

In addition to the slides, the talk was illustrated by dyed skeins showing all the important vat dyes on wool skeins and on viscose-wool skeins, azoic dyes on wool-viscose skeins, sulfur dyes on wool-vicose skeins, and soluble vat dyes on wool-viscose skeins.

In the Appendix is more detailed information about dyeing methods.

Appendix

Ammonia—Sodium Lignin Sulfonate Method

List of Most Suitable Dyes for Viscose-Wool Mixtures and the Formulas for Stock Vats.

STOCK VAT PER 1 LB. DYE AT 140°F.

Group	Dye	Monopole Soap	Water Gallons	Caustic Soda 70° TW.	Hydro
I.	I. Yellow 5GK Powder.....	1 lb.	6	2 lb. 13 oz.	1 lb. 8 oz.
I.	I. Brill. Orange GK Powder Fine	1 lb.	3	3 lb. 4 oz.	12 oz.
I.	I. Scarlet B. Powder.....	1 lb.	6	5 lb. 3 oz.	1 lb. 8 oz.
I.	Calcoloid Pink FFD Double Powder	6 oz.	6	3 lb. 10 oz.	12 oz.
I.	I. Corinth RK Powder	1 lb.		5 lb. 3 oz.	1 lb. 8 oz.
I.	Calcosol Khaki G Paste	2 oz.	¾	12 oz.	4 oz.
I.	I. Grey K Powder	1 lb.	6	5 lb. 3 oz.	1 lb. 12 oz.
II.	Calcosol Red BN Double Paste	4 oz.	1½	14 oz.	6 oz.
II.	Calco Vat Brill. Violet RK Dbl. Pst.	4 oz.	1½		6 oz.
II.	I. Violet BBK Powder	1 lb.	6	1 lb. 8 oz.	1 lb. 8 oz.
II.	I. Blue 5G Powder	1 lb.	6	2 lb.	2 lb.
II.	Calcosol Jade Green Supra. Double Paste	4 oz.	2	1 lb.	8 oz.
II.	I. Brill. Green GG Pdr. Fine Conc.	1 lb.	6	1 lb. 8 oz.	1 lb. 8 oz.
II.	I. Brill Green 4G Pdr. Fine Conc.	1 lb.	3	1 lb. 8 oz.	12 oz.
II.	I. Brown 3GT Pdr. Fine....	8 oz.	3	2 lb. 7 oz.	13 oz.
II.	Calcoloid Olive R Dbl. Pdr...	4 oz.	1½	1 lb. 8 oz.	6 oz.
III.	Calco Vat Golden Orange 3G Paste	2 oz.	¾	11 oz.	4 oz.
III.	I. Yellow Brown 3G Powder Fine	8 oz.	3	2 lb. 13 oz.	14 oz.
III.	Calcoloid Brown BR Double Powder	4 oz.	1½	1 lb. 8 oz.	6 oz.
III.	Calcoloid Brown G. Double Powder	4 oz.	1½	1 lb. 8 oz.	6 oz.
III.	Calcosol Brown 2GW Paste..	4 oz.	1½	1 lb. 8 oz.	6 oz.
III.	Calcoloid Brown R Double Powder	4 oz.	1½	1 lb. 8 oz.	6 oz.
III.	I. Brown FFR Powder Fine.	8 oz.	3	2 lb. 2 oz.	12 oz.
III.	I. Red Brown 5RF Pdr.....	1 lb.	6	2 lb. 13 oz.	1 lb. 8 oz.
III.	I. Olive 3G Powder Fine	12 oz.	4½	3 lb. 8 oz.	12 oz.

The Stock-Vat is added to the dyebath prepared as follows:

0.75% Sodium Lignin Sulfonate)
2-3% Ammonia) on weight of yarn
2% Hydro)
Ratio 1:25
Temperature of Dyebath:
Group I = 113° F
Group II = 140° F.
Group III = 165° F.

After dyeing has been underway for 15 minutes, 15% of salt is added and dyeing proceeds for 30-45 minutes longer. The dyebath is cooled to 113° F. by adding cold water, the yarn is removed centrifuged, air oxidized, acidified at 100° F. to 175° F., aftertreated with a synthetic detergent, and rinsed.

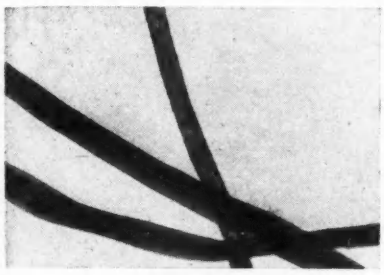
Caustic Soda-Sodium Lignin Sulfonate Method

The dye is reduced with caustic soda and hydro and added to the dyebath containing caustic soda, hydro and ¼ oz. of sodium lignin sulfonate per gallon. The total caustic concentration in the dyebath should not exceed ½ oz. per gallon and the temperature should not exceed 140°F. Common salt is added to the dyebath to produce better exhaustion, especially upon the wool. If necessary, in order to promote level dyeing the dyeing can be started at 70° F. and the temperature slowly increased to 120° F. or 140° F.

The pigment method of dyeing can also be used, in which case the pigment dispersion of dye is circulated through the material, and then in sequence there is added: sodium lignin sulfonate, caustic soda, hydro, and salt.

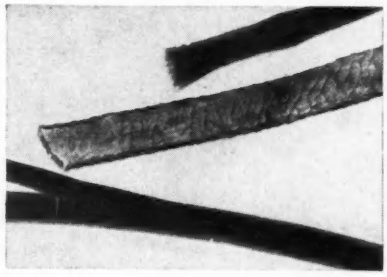
Trisodium Phosphate Method

This method is similar to the preceding one except that the caustic soda is replaced with from 1½ to 4 oz. of trisodium phosphate per gallon.



Slide 29

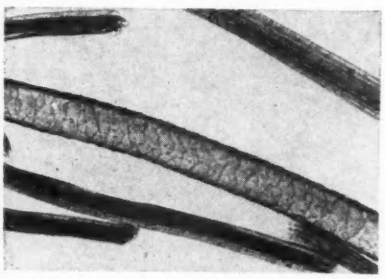
Calcogene Blue 2GCF



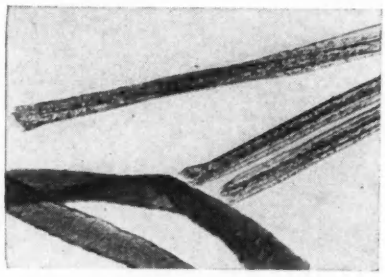
Slide 30

Calcogene Black 5GCF

Dyed at 140° F. with Sodium Sulfide and Sodium Lignin Sulfonate



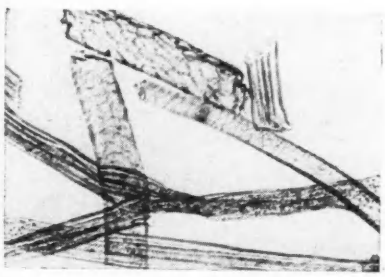
Slide 31



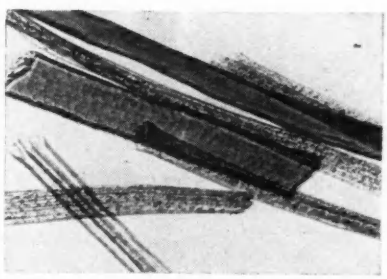
Slide 32

Soluble Vat Blue O4B

Dyed by the Cotton Method — *Dyed by the Wool Method*



Slide 33



Slide 34

Soluble Vat Jade Green

Dyed by the Cotton Method — *Dyed by the Wool Method*

Pretreatment with Aerosol C61

Before dyeing, the yarn is treated for 20 minutes at 140° F. in a bath containing ½% of Aerosol C61 on the weight of the yarn.

Sodium Stannate Method

The dye is reduced with Caustic soda and hydro and added to the dyebath at 120° F. which is prepared with:

Caustic Soda	½ oz.)	
Hydro	½ oz.)	Per Gallon
Sodium Lignin Sulfonate	¼ oz.)	
Sodium Stannate	½ oz.)	

Salt is added to produce better exhaustion of the dye.

Azoic Dyes on Wool-Viscose Yarn 1:20—Bicarbonate Method

Naphthol	1 lb. 4 oz.
Alcohol	2 lb. 8 oz.
Caustic Soda	2½ oz.
Warm Water	2 lb. 8 oz.

Dissolve and add 10 oz. Formaldehyde 30% Add the naphthol solution to the dyebath at 140° F. Containing:

Sodium Bicarbonate	1 lb. 5 oz.
Sodium Carbonate	2 lb. 8 oz.
Synthetic Detergent	2 lb.
Water	100 gallons

Add 16 lb. Common Salt.
Naphtholate the yarn for 30 minutes at 140° F.
Centrifuge the yarn and then develop cold with the fast color salt, rinse, and aftertreat.

Azoic Dyes on Wool-Viscose Yarn 1:20—Caustic Soda-Sodium Lignin Sulfonate Method

Naphthol	1 lb. 4 oz.
Alcohol	2 lb. 8 oz.
Caustic Soda	3½ oz.
Warm Water	2 lb. 8 oz.

Dissolve and add 10 oz. Formaldehyde 30% Add the naphthol solution to the dyebath at 140° F. Containing:

Caustic Soda	3 lb.
Sodium Lignin Sulfonate	2 lb.
Synthetic Detergent	2 lb.
Water	100 gallons

Add 16 lbs. common salt and proceed as in the previous method.

Sulfur Dyes on Wool-Viscose Yarn 1:20—Dextrose-Sodium Sulfite Method

Dissolve the dye as follows:

Per 1 lb. Dye	
Sodium Sulfite	1 lb.
Dextrose	1 lb.
Soda Ash	1 lb.
Water	2 gallons

Boil 5 minutes

Add to the dyebath, containing per 100 gallons at 140° F.

Sodium Lignin Sulfonate	2 lb.
Common Salt	10 lb.

Enter the yarn, dye 45 minutes, rinse, acidify and rinse.

Sulfur Dyes on Wool-Viscose Yarn 1:20—Sodium Sulfide-Sodium Lignin Sulfonate Method

This differs from the usual sulfur dyeing method only in the addition of ½ oz. sodium lignin sulfonate per gallon of dyebath and the maximum dyeing temperature of 140° F.

Williams Unit—

(Concluded from Page P262)

half-inch through the quarter-inch area and back through the half-inch well. If you study the physical action of that machine when it is half filled with water, you can see the tremendous cyclonic turbulence you get. I might explain that if the returns were blocked up on that machine and the liquor that was carried by the cloth running at 100 yards a minute measured, you would carry through the machine a total of 180 gallons of water a minute. The machine is so designed to take care of that turbulent force and return that volume of liquor to the starting point of the cloth. I don't know of any other box or mechanism that would do that same thing.

Question: Getting back to the naphthols, I was wondering if you were thinking entirely of cotton?

Mr. Williams: Naturally, to date, the majority of naphthol work has been produced on cotton fabrics. There has been a small yardage of naphthols produced on rayon, but not a great deal, and if you run naphthols continuously on any fabric I think it would be necessary to dry your naphthol in order to get control of your coupling bath and in order to get proper penetration. It would be quite a problem to try to do it wet.

Member: I appreciate that. In other words, the penetration would be better dry.

Mr. Williams: That is right.

Question: But there is no reason that you can think of why rayon shouldn't be handled as easily as cottons?

Mr. Williams: The only reason we have seen so far for not drying many of the rayon fabrics is that you have a difference of affinity between many of the mixed fibers. Drying them, when using a product like naphthol AS which has no affinity, the naphthol would tend to migrate to the fiber that had the greatest affinity. You would dry it on that fiber and would have a mottled appearance when you coupled it.

Question: Have you tried this Unit without padding?

Mr. Williams: We have dyed many types of dyestuffs without padding.

We have just recently finished a lot of cambric heavy shades, direct colors, dyed in a starch medium keeping the starch at a boil, dyeing and starching in one operation without any pad.

Question: In dyeing sulfur colors, don't you get any exhaustion?

Mr. Williams: Certainly you get exhaustion.

Member: Between colors?

Mr. Williams: Certainly. When using in a formula three colors that vary in exhaust, you have to set up your feeds to take care of the relative exhaustion between the types of dyestuffs being used.

Nylon and/or Acetate—

(Concluded from Page P268)

Conclusion

In conclusion, nylon-wool blends offer attractive possibilities for extremely fine fabrics. With proper thermosetting they will have soft hand, good drape, life and character, as well as ability to recover from wrinkling and to resist shrinkage during washing. With careful color selection, adequate fastness to both light and washing can be obtained for men's wear fabrics, sweaters, dress goods, etc. Current information indicates that the premetallized types such as the "Chromacyl Colors" and selected fast-to-light neutral dyeing acid types offer the best possibilities for fast shades on wool-nylon blends. May I stress again the fact that at the present time each fabric and shade presents its own problems and should be tackled in this light, remembering always that while past information on the usual fiber for the color type may be a guide, it should be carefully tested and verified on nylon before it is used, since peculiar and unpredictable properties and shades crop out when colors are applied to nylon.

EMPLOYMENT REGISTER

This column is open for four insertions per year, per member, without charge. Blanks can be obtained from, and filed with, the Secretary of the Association, Lowell Textile Institute, Lowell, Mass. It is understood that these will be open to inspection by prospective employers, who can obtain further information through the code numbers from the Secretary.

47-26

Education: High school, with college extension courses.
Experience: Nineteen years with two companies, mainly skein dyeing, various fibers, in charge of department.
Age 39; married, references; will work anywhere in U. S.

47-27

Education: Graduate Pratt Institute, additional college training.
Experience: Twenty years research, development, control; biochemistry, intermediates, dyestuffs.
Age 44; married; references.

47-28

Education: Graduate, Lowell Textile Institute, 1940.
Experience: Chemical laboratory and plant control, dyes and textile resins.
Age 30; married; references.

National Convention
October 23, 24 and 25
Congress Hotel, Chicago
Auspices: Mid-West Section

The Production of Fast Shades on Mixed Fibers—

Discussion*

Round Table Discussion Conducted by Piedmont Section

January 25, 1947

Q. On a cloth containing approximately 60% spun rayon and 40% wool, I would like to know if it is possible to obtain box to box matches and also get 40 hour light fastness with beck dyeing.

A. (1) With careful weighing of dyestuff, proper handling, and same grade of blended fibers, I don't see any reason why you couldn't expect box to box matches.

(2) Using a good group of selected dyestuffs, you would get 40 hour light fastness.

Q. Is it better to use salt at the start of dyeing or after it has been brought to temperature?

A. Our experience shows better results are attained if the salt is added after the material has run for some time.

Q. What effect would previous singeing have on dyeing properties?

A. No effect.

Q. Is it possible to reprocess wool after urea formaldehyde treatment in order to obtain even dyeing?

A. Yes.

Q. Have wool blends been successfully padded and jigged with fast-to-light colors?

A. I know of one mill that has been dyeing vat colors by the pad pigment jig method for a number of years.

Q. What amount of alkali (pH) can this blend take and what factor does time and temperature play on it?

A. Answered in Papers. (A pH of 11 to 12 has been found not too excessive if a temperature of 140° F. for one hour, in the presence of sodium lignin sulfonates (¼ oz./gal.), is not exceeded.)

Q. Have you encountered any unevenness due to uneven blending that shows up dyeing as having a motley effect?

A. Yes. Unevenly blended yarn shows up poorly when dyed by most methods. The vat acid method definitely improves the results, when vats are being applied.

Q. Can heavy shades such as navies be dyed on mixtures of viscose and synthetic protein fiber in vat colors?

A. Viscose rayon and wool, yes; I wouldn't want to try it on aralac, Draxon, etc., as these latter fibers are very sensitive to alkali.

Q. What can be done to overcome "two-tone" on mixtures of cotton and viscose, where the construction does not permit mercerization?

A. The pad-steam method will give complete union on viscose—cotton material. It is necessary to dry after padding. Another method is the sodium stannate procedure.

Q. How can fabrics made of viscose and acetate best be dyed in solid shades with fast colors?

A. By vat colors only, using fast reduction methods, at temperatures of 160° to 180° F. There is some saponification but not enough to give excessive trouble.

Q. What is the best method for dyeing full fashioned silk hosiery with cotton seam and nylon toe? The difficulty here is the tendency of the nylon dyes to stain the silk and the silk dyes to stain the nylon . . . especially in additions.

A. By proper selection of dyes for each particular job; it is mostly a "trial and error" proposition.

Q. In dyeing rayon and wool combinations can better light fastness be obtained by a short dyeing time using an excessive amount of wool dyes, or by a longer dyeing starting without wool color and only shading the wool towards the end of the dyeing after it has been stained by the direct color used on the rayon?

A. Better light fastness can be attained if the shade is built up with a good selection of light fast directs and shaded with the proper wool colors.

Q. What is the best method of dyeing mercerized cotton and nylon unions leaving acetate clean? Using faster dyes on the nylon than the usual acetate colors? Also, the fastest method for dyeing wool-nylon unions leaving acetate clear?

A. It has been suggested to start with direct colors leaving the acetate white. The nylon can perhaps best be handled with properly selected acid colors or the pre-metallized types. With regard to nylon-wool mixtures a good range of acid and pre-metallized types are available and give good unions. Dyestuff selection is very important for multiple fiber work.

Q. In the dyeing of wool with immunized cotton present, acid must be used to exhaust the color on the wool, and this seems to affect the immunization, for the cotton will be heavily stained. Can this be overcome?

A. Use neutral dyeing wool colors and avoid use of acid.

Q. To obtain the best fastness on combinations of wool and rayon where the rayon is to be left white, chrome colors have been tried. This gives the wool the necessary fastness but the rayon is stained to such an extent it must be stripped. This action imparts harshness and felting of the wool. Can this be overcome by chemical means?

A. The use of glue has been suggested to hold the color off the rayon. Another is an acid after-treatment which cleans up the rayon. Dye selection is also important.

Q. What is the best way to cover thick and thin yarns in a piece so they do not look streaky when dyed? The fabric in question is 80 per cent rayon, 20 per cent wool.

A. The vat-acid method is recommended; I know of two mills getting good results.

Q. What is the best way to achieve level dyeings on rayon and rayon-wool blends?

A. By dyestuff selection and temperature control; wool shows maximum affinity at high temperatures.

Q. What is the best method to obtain a fast to light and washing black on wool and rayon and leave the acetate white in a three way blend of acetate, viscose and wool?

A. The developed blacks of the O.B. type are the best that can be offered on this problem.

Q. Can fabric made of viscose and acetate staple be pad dyed into a solid shade which is fast to light, washing and gas fading?

A. Use vat colors for this work.

Q. What are the correct methods of pre-

* This discussion took place following the presentation of papers by H. F. Clapham, Ormond W. Clark, and L. S. Thompson.

paring fabrics made of viscose, wool and acetate?

A. The fatty alcohol sulfates are best for this job.

Q. *Is special preparation required for viscose and wool mixtures, if so what type?*

A. The goods should be entered in a cold wash to remove tint and an enzyme used to remove size, if necessary, at low temperature. The actual scouring can then be carried out with a detergent of the sulfated fatty alcohol type and if desired the bath can be raised, not exceeding 160° F.

Q. *Is chlorination practical and of value on such mixtures for obtaining better unions with vat colors?*

A. Chlorination may improve, if the yarn damage caused by this process and subsequent vat dyeing does not exceed the limitations of the end use of the material being handled.

Q. *What compound may be used to retard or lessen the affinity of animal fibers in mixed goods for vat dyestuffs?*

A. Retarding is not necessary in most cases; wool has less affinity than other fibers.

Q. *What effect on strength and wearability does the application of fast colors haveon the animal fibers in the goods?*

A. Mild alkali may slightly strengthen wool; however, the wearability is somewhat effected. A lot of material has been handled commercially, however, by this method.

Q. *How could the Kupensauer method be used to advantage in dyeing mixed fibers containing wool?*

A. It has definite interest particularly where different grades of fibers show up bad effects due to blending.

—♦ ♦—

Council Meeting—

(Concluded from Page P264)

J. S. Rhodes
J. Skramstad
A. W. Visocki
G. R. Wildermuth
C. Young

ASSOCIATE

N. Bauer
R. L. Brett
R. E. Colby
A. M. Butler
D. B. Davis
A. N. DeLoach
P. J. De Reyer
J. W. Dooley
M. M. Eckhardt
J. M. Farmer
P. J. Fynn
O. M. Garcia
H. P. Godard
L. N. Harrison
H. A. Headinger
R. E. Hill
A. B. Jennings
H. A. Keenan
G. Kushner
B. M. Lack
C. G. Lauster
S. Levin
L. D. Mailloux
C. A. McLean
A. S. Mendoza
H. T. Newman
J. A. Ornelas
G. J. Pepe
L. Porter
M. C. Powers
D. F. Regnery
D. J. Reilly
L. J. Renaud
G. M. Rojas
H. N. Sachs
J. G. Scharff
N. H. Shah
C. B. Vadon
E. A. G. Wallertz
H. A. Wellington
E. F. Werly

STUDENTS

K. W. Bean
G. Bedard
S. Berman
L. Bess
P. G. Brogan
J. A. Burrell
R. L. Carroll
F. O. Chase, Jr.
W. M. Clark, Jr.
T. G. Clayton
R. N. Combs
R. T. Cummings
P. N. Dargie
W. M. Foley
A. I. Garblik
L. C. Gardner
W. M. Gardner
R. L. Gill
H. G. Grundy
A. D. Gusman
R. Hahn
C. P. Hoffner
H. R. Houghton
J. W. Jerome
R. Johnston
J. B. Koller, Jr.
G. O. Langlais
M. Levin
A. R. Liederman
P. E. MacLean
G. C. Majeune
D. G. Manolis
F. Martinez
F. Y. Mathews
E. G. Maynard
C. D. Maynard, Jr.
S. D. McMahon
A. E. Medas
R. B. Meister
G. C. Morel
J. R. Motha
H. L. Nickerson, Jr.
R. E. Petersen
A. Price
W. J. Reines
P. V. Riley
A. E. Sargent
T. R. Scanlan, Jr.
J. A. Simmons, Jr.
S. Sorkin
B. Sugarman
J. W. Sweeney
S. R. Tomko
J. K. Tunkle
G. E. Walker
H. Woo

TRANSFERRED FROM OTHER CLASSIFICATIONS TO SENIOR MEMBERSHIP WERE:

P. O. Anderson
H. W. Berry
M. L. Blitz
R. C. Bruck
P. S. Buffington
H. A. Busby
C. J. Conner
R. H. Edgar
G. F. Goldstein
C. G. Herrick
T. X. Johnidis
H. L. King
G. J. Mandikos
W. Mannheimer
D. Moss
J. W. Ross
M. L. Slesinger
W. E. Smith
J. D. Towery
A. Viola
R. J. Ziegler

Respectfully submitted,
H. C. CHAPIN,
Secretary

—♦ ♦—

Meeting, Philadelphia Section

THE Philadelphia Section meeting was held on April 11, 1947, in the North Roof Garden at the Bellevue-Stratford Hotel.

Walter Fancourt, Chairman, introduced the speaker of the evening, Dr. Frederic Bonnet of the American Viscose Corporation. His subject was "Flammable Fabrics and Their Evaluation." Cameron Baker, U. S. Testing Company, demonstrated the testing device which has been worked out by the committee of the AATCC.

There were 106 present for dinner and 125 attending the meeting.

Respectfully submitted,
A. E. RAIMO, *Secretary*

—♦ ♦—

Meeting, Rhode Island Section

THE regular monthly meeting of the Rhode Island Section was held on Friday, April 25th, at the Providence Engineering Society Hall with approximately 125 members and guests present.

P. J. Wood, Technical Director of the Royce Chemical Company, spoke on "Enzymes in Textile Processing." His talk covered a description of the various enzymes: their uses and a discussion of methods of testing and evaluating them.

A film entitled "How Rayon is Made" was shown through the courtesy of American Viscose Company. Harry Creegan was on hand to answer questions.

Respectfully submitted,
EMORY A. RICHARDS, *Secretary*

CALENDAR

EXECUTIVE COMMITTEE ON RESEARCH
Meeting: June 4 (Hotel Pennsylvania, New York).

COUNCIL
Meeting: June 6 (Hotel Pennsylvania, New York).

RESEARCH COMMITTEE
Meeting: June 6 (Hotel Pennsylvania, New York).

NEW YORK SECTION
Outing: June 20. (North Jersey Country Club).

PHILADELPHIA SECTION
Meeting: May 23.
Outing: June 13. (Atlantic City Country Club).

NORTHERN NEW ENGLAND SECTION
Meetings: September 26, November 21.
Outing: June 13.

PIEDMONT SECTION
Outing: June 20 and 21. (Ocean Forest Hotel. Myrtle Beach, S. C.)

MID-WEST SECTION
Outing: June 21 (Lake Lawn, Delavan, Wis.)

SOUTHEASTERN SECTION
Meeting: June 7. (Atlanta, Ga.)

NATIONAL CONVENTION
October 23, 24, 25. (Congress Hotel, Chicago. Ill.)

TRADE NOTES • NEW PRODUCTS

• International Exposition of Textiles

"Fabrics of tomorrow in fashions of tomorrow" will make their debut before the trade and buying public at the International Exposition of Textiles, Trimmings and Factory Equipment. The exhibition is to be held at Grand Central Palace, New York, June 2-7 and June 10-14. The exposition will afford designers, manufacturers of apparel and accessories and the public with their first opportunity to view the advancements which have been made in the field, according to Arthur Tarshis, president of the management corporation.

A world wide audience is expected to attend the novel exposition which combines textiles, trimmings and allied factory equipment into one combined exhibition. Visas have already been extended to over 3400 persons representing 28 countries as leaders in various phases of the industry, Mr. Tarshis continued.

The first week, June 2-7 inclusive, the showing will be opened exclusively to members of the textile-apparel trades embracing manufacturers, retailers, fabric buyers, buyers of fabric merchandise, fashion editors, designers and others identified with the industry. The exhibit will be extended from June 10-14 to permit the general public to see what the fabric and trimming manufacturers of the United States and abroad have developed for their wardrobes of the future. Doors will be open during the showing for the trade from 10.30 A.M. to 10:00 P.M. During the second week's show for the public doors will be open from 11:00 A.M. to 11:00 P.M.

Over 350 exhibitors will be represented through their displays at the show at Grand Central Palace. Included are leaders in the field of fabrics such as silk, wool, worsteds, cotton and rayons; accessories, including buckles, buttons, belts and other ornaments as well as factory equipment. In addition to the products of mills in the United States, special planes have been chartered to bring exhibits from Italy, France, Holland, Switzerland, Great Britain and others. These exhibits reach the total of 100 with the largest contingent coming from Italy. Those of France will represent the second largest group with those of Holland in the third largest group.

The first and second floors of the Grand Central Palace will spotlight displays and demonstrations of textiles including woolens, worsteds, silks, and cottons as well as fabric finishes. Feature of the third floor will be new factory equipment, trimmings and other supplies. Foreign exhibits from European markets and Latin American countries are planned for the fourth floor.

• Delta Kappa Phi Convention

Delta Kappa Phi Fraternity of America, oldest professional textile fraternity in America, recently held the most successful Convention in its history at the University Club in Boston, Mass.

The delegates from each active chapter were: James R. King, Robert J. Peirent, William C. Bates and Thaddeus J. Bonczar of Beta Chapter of the Lowell Textile Institute; John H. Dooley, Joseph F. Sargent, Jr., Louis F. Cocker and Eugene K. Chapman, Jr., of Delta Chapter of the New Bedford Textile Institute; and Charles A. Kennedy and John R. Stewart of Alpha Chapter of the Philadelphia Textile Institute.

The Supreme Council consisting of Supreme Consul John E. Foster; Supreme Pro-Consul Francis Tripp; Supreme Custodian Eliot Borden and Supreme Annotator Kenneth S. Tripp were re-nominated and re-elected by unanimous vote of the Convention to carry on for another year.

It was the hope of all present that during the coming year it would be possible to establish new chapters in several other schools of this country and Canada. Also it was the wish of the Supreme Annotator that the address file could be further corrected by active and alumni members sending in correct addresses.

The audit of the Supreme Custodian's Books showed them in good order but with further financial support necessary to carry on the future work of the fraternity.

Sigfred Carlson, Alumni Member of Delta Chapter, again extended the use of his home in Marshfield, Mass. for another clambake to be held in September, details to be handled by the Supreme Council.

The business meeting was followed by a banquet and entertainment attended by about 100 members.

• Callaway Textile Dictionary

Callaway Mills, LaGrange, Ga., have announced the publication, under their sponsorship, of the First Editon of the Callaway Textile Dictionary, a 390-page volume containing concise definitions of more than 6,000 words and terms used in connection with textile manufacturing and textile products.

"There has long been a need for a dictionary of textile terms, comprehensively and accurately covering the terminology of textile manufacturing and its products, for use by persons engaged in the textile industry and in the related industries and professions," it is stated by A. B. Edge, Jr., president of Callaway Mills in the Foreword of the publication.

In preparing this First Edition, the authors set up a framework embracing basically those products contained in the categories of yarns and woven fabrics. This includes the dyeing and finishing processes, the major fibers used (both natural and synthetic) and the steps involved in the production of the completed articles. Within this framework, an effort was made to list and define as far as was practicable, the significant terms used in connection with these subjects. A large number of unusual terms are included in additon to those of common and current usage.

In order to adhere to the concept of a dictionary, conciseness was sought, at the occasional possible sacrifice of detail such as would have been included in a work of a more encyclopedic nature.

The volume represents a consolidation of the work of three authors—W. L. Carmichael, George E. Linton, and Isaac Price—who had begun separately, years ago, the task of accumulating, defining and organizing a listing of textile terms. Mr. Carmichael is a member of the faculty of the A. French Textile School of the Georgia School of Technology, Atlanta, Georgia; Dr. Linton is dean of the textile department, Fashion Institute of Technology and Design, New York City; and Mr. Price is on the staff of the Straubenmuller Textile High School, New York City.

In addition to the more than 6,000 definitions of terms, the book contains 66 illustrations designed to aid in an understanding of the definitions illustrated.

Copies of the Callaway Textile Dictionary are available from Callaway Mills, LaGrange, Ga. The price is $4.00 per copy.

• German Textile Technology Books

The Office of Technical Services has asked American publishers to reprint some of the more important reports on

developments in the German textile industry in book form, and to combine a number of similar reports in one volume. Reports thus reproduced commercially are usually cheaper than the photostats which have been available, and considerably more legible. In addition, they may be obtained immediately, thus doing away with the weeks of delay which often take place when a report is ordered from the Office of Technical Services.

One of the firms which is cooperating with the Office of Technical Services is Mapleton House, 5415 17th Avenue, Brooklyn 4, New York, which will soon publish five books dealing with the German textile industry.

Mapleton House is reproducing the most important German reports by photo offset, and has adopted a handy pocket-size which makes the volumes easy to handle. Great care is being given to obtain the best possible reproduction of the diagrams and photographs.

The five books which will be available shortly are:

Textile Machinery, $8; German Cotton, Rayon and Silk Industries, $5; German Rayon and Staple Fiber Industry and Allied Engineering Industry, $4; Textile Auxiliary Products, $3; and Study of Wool Substitute Fabrics, $2.

• Advisory Committee, Ultimate Consumer Goods

Robert A. Seidel, vice president and comptroller, W. T. Grant Company, was elected chairman of the Advisory Committee on Ultimate Consumer Goods of the American Standards Association at its spring meeting.

Mr. Seidel succeeded Irwin D. Wolf, vice president, Kaufmann Department Stores Inc., Pittsburgh, as head of the correlating committee which supervises ASA work in the consumer goods field.

Dr. Faith M. Williams, director, Staff on Foreign Labor Conditons, U. S. Department of Labor, was elected vice chairman of the ACUCG, succeeding Dr. Dorothy Houghton of Teachers College, Columbia University.

The ACUCG at the same time elected to its Executive Committee:

Dr. Anna M. Dooley, supervisor of Home Economics of the American Home Economics Association. Dr. Dooley resides in Newark, N. J.

Dr. Jules Labarthe, Jr., Senior Industrial Fellow, Mellon Institute of Industrial Research, Pittsburgh, Pa. Dr. Labarthe represents the National Retail Dry Goods Association.

Leonard S. Little, manager of the textile service section, E. I. du Pont de Nemours and Co. representing the Synthetic Organic Chemical Manufacturers Association, New York City.

E. M. Edgerton, director of the technical control department, Pacific Mills, representing the National Association of Finishers of Textile Fabrics, New York City, was re-elected to the committee.

• Colgate Salesman for Wisconsin

R. E. Gruber who has been appointed industrial salesman for the entire State of Wisconsin for the Colgate-Palmolive-Peet Company of Jersey City, N. J. Mr. Gruber, who has been headquartering in Stevens Point, Wisconsin, for the last seven years, formerly covered only the northern part of the state. As a result of his promotion, he will transfer his headquarters to Milwaukee and will serve all of Wisconsin for Colgate's industrial division. He may be reached at present in care of the Colgate-Palmolive-Peet office, 919 North Michigan Avenue, Chicago, Illinois.

• Southern Sales Manager, Textile Resin Department, American Cyanamid

R. W. Angstadt, who has been associated with the Textile Resin Department of American Cyanamid Company since 1945 as a chemical engineer, has been appointed southern sales manager of the department.

Mr. Angstadt has had twenty-four years of experience in the textile finishing field. His work has involved processing of silk and synthetic yarns, novelty and flock printing and other finishing experience covering a wide variety of fabrics.

In the Textile Resin Department Mr. Angstadt did intensive research work with chemical applications for shrinkage control of woolens (Lanaset resin), durable crispness, softness, drape and hand of fabrics, odor and stain resistance and durable glazes.

Mr. Angstadt is a member of the American Association of Textile Chemists and Colorists and the American Association of Textile Technologists. He received his training in chemical engineering at Bucknell University. Before joining the staff of the Textile Resin Department, Mr. Angstadt was associated with the National Silk Dyeing Company and the Dominion Silk Dyeing and Finishing Company in various supervisory capacities, and was for eighteen years superintendent of the Dominion plant at Drummondville, Quebec.

• "Prospecting for Petroleum"

The Shell Oil Company, Inc., 50 West 50th Street, New York 20, N. Y., has available for showing to interested groups a new sound color film entitled: "Prospecting for Petroleum." This is the first in a series of short films intended to present the story of oil and the oil industry in an accurate but non-technical manner. It employs a three dimensional animation technique new to industrial films.

• C.A.T.C.C. Annual Meeting

Herbert E. Wieland, Chairman of Publicity for the Northern New England Section, AATCC, reports that he attended the combined annual meeting of the Quebec and Ontario Sections of the Canadian Association of Textile Chemists and Colorists held on April 18th and 19th at the Mount Royal Hotel, Montreal. The attendance was the largest ever.

He also reports that an outing will be held on June 14th at Guelph, Ontario, and that in conjunction with the Quebec government a textile school is being run successfully at St. Hyacinthe, P. Q., and in Hamilton, Ont., one is being run in conjunction with the Ontario Government.

Officers of the Quebec Section elected at this meeting for the 1947-48 season were as follows: *President:* H. K. Torpey, *Vice-Presidents:* F. D. Wallace and C. Wills, *Secretary-Treasurer:* R. W. Redston, *Council:* W. Stansfield, L. J. Sheps. J. Shower, E. Sewell, W. H. Pover and S. Milnes, *National Council Representatives:* F. J. Knights, W. Olpinsky and G. C. Taylor, *Alternates:* H. K. Torpey and F. D. Wallace, *Federation Representatives:* W. King and R. W. Redston, *Alternates:* J. K. Torpey and F. D. Wallace.

Mr. Wieland further reports that it was indicated a delegation would attend the National AATCC Convention in Chicago in October.

• New Demineralizer

A new "Filt-R-Stil" Water Demineralizer, known as the Model U-60, has recently been developed by the Ion Exchange Products Department of American Cyanamid Company. The Model U-60, like other "Filt-R-Stil" Demineralizers, is designed to transform ordinary tap water into the chemical equivalent of distilled water at a small fraction of the cost of distilled water. The ease with which the Model U-60 is operated and maintained is said to offer unique advantages in water treatment: it requires no heat, no steam, no auxiliary equipment, and only enough electricity to light a 6-watt bulb.

The new "Filt-R-Stil" Demineralizer Model U-60, delivers water operating at a flow rate of 60 gph. That is chemically equivalent to distilled water but costs much less.

The Model U-60, designed to operate at a 60 gallon per hour flow rate, can be used to deliver water containing a maximum of 10 parts per million of ionized solids—or as little as 1 part per million. A "built-in" controller indicates the actual quality of all treated water leaving the Unit; no auxiliary analytical tests are required.

Other standard "Filt-R-Stil" Demineralizers are available in capacities ranging from 8 gallons per hour to 1200 gallons per hour; larger Units are specially designed for the user's particular needs. Further information may be obtained from American Cyanamid Company, Ion Exchange Products Dept., 30 Rockefeller Plaza, New York 20, N. Y.

• Hooker Chemicals

A new edition of Hooker General Products List, Bulletin 100, has just been published by the Hooker Electrochemical Company, Niagara Falls, N. Y.

This new bulletin represents a departure from previous products lists in that it now comprises 20 pages of description, principal physical and chemical properties, graphic formulas, uses and shipping information, in new format and arrangement that make it easier to find information on Hooker Chemicals.

Several new products and brief descriptions of the various chemical processes and facilities which Hooker has available for industry are also included in this General Products List. Copies are available to those interested when requested on company letterhead.

• 1947 Fall Woolen and Rayon Cards

The regular editions of the 1947 Fall Woolen Card featuring Icetones and Winter Sun Colors and the 1947 Fall Rayon Card featuring Crystal Pastels and Gala Hues have just been released to the trade by The Textile Color Card Association. Each edition contains forty shades.

• Elected President, National Council of Importers

Morris S. Rosenthal, Executive Vice-President and Director of Stein Hall & Co. Inc., was elected President of the National Council of American Importers on April 22nd at the Council's annual meeting in the Hotel Commodore, New York.

Dye Nomenclature—

(Concluded from Page 254)

was accepted that something might be done in the future, as for example making an attempt to reach agreement on the use of the suffix letters and numerals." He thought that the compilation of the Second Edition of the Colour Index (now being undertaken jointly by his Society and the AATCC) would produce "a wealth of information regarding nomenclature anomalies" so that the Society would be in a position to make some "constructive suggestions for the future which would be likely to be acceptable to both dye manufacturers and dye users." Manufacturers and consumers in America will await these suggestions with much interest.

In closing, it should be pointed out that although dye manufacturers "strongly deprecated any changes in established names" (as quoted from the preceding paragraph), the records of the dye industry show many instances where the manufacturers themselves have altered the names of their dyes when it was to their advantage. One remembers the drastic changes in the names of many of the vat dyes a generation ago; and also recalls that there was little or no resulting confusion. It is the writer's sincere hope that this presentation may serve to stimulate interest in the whole subject of dye nomenclature, and possibly crystallize action leading to its improvement. As Mark Twain once said of the weather, "Everybody complains about it, but nothing is done."

References

(1) "The Naming of Dyes." Color Trade J. *1*, 59 (1917)
(2) "Nomenclature of Dyestuffs." Ibid. *6*, 29 (1920)
(3) "On Color Names: the Art of Word Making." Am. Dyestuff Reptr. *16*, 525 (1927)
(4) "The Nomenclature of Commercial Dyestuffs." Rayon Textile Monthly, *26*, 345 (1945)
(5) "Dyestuff Nomenclature." J. Soc. Dyers Colourists *61*, 321 (1945)

COMMUNICATION

Re Kupensaure Process

Editor, American Dyestuff Reporter
Dear Sir:

In connection with the article "An Evaluation of the Kupensaure Process," presented by the Piedmont Section, and published in Volume 36, No. 6, of the American Dyestuff Reporter, I wish to state that this process was worked out by me in my research laboratory in Paris, France in 1928.

In 1929 I introduced the said process in one German plant, Julius Schurer A.G. in Augsburg; a few months afterwards, I introduced it into Herr & Co., Uzwil, Switzerland, and into Walter Evans & Co., Darley Abbey, England.

Later on, in the early thirties, I had the opportunity of introducing it in The United States.

At the present moment, over thirty finishing plants, in Europe and America, are using my process of vat-dyeing in acid conditions, which I introduced during the last sixteen years. Of course, there are many variations of the same process, as I had to adapt it in every case to the special conditions and needs of the plant.

Yours very truly,
Vincent Chmielniski.

• PATENT DIGEST •

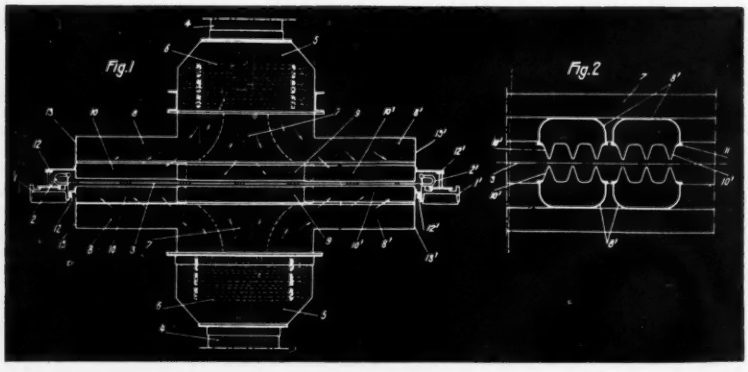
Tenter Frame With Adjustable Walls G, 3

Brit. P. 578,735
(Dungler—July 10,1946)

Tenter frames for cloth drying show generally an arrangement of blowing nozzles at a long distance above or beneath the surface of the cloth. This arrangement is provided because of the generally often occurring changing width of the cloth. An air cushion is formed in this case between the orifices of the nozzles and the cloth. This is the reason why the velocity of the air decreases very rapidly whereby the practical efficiency of the tentering machine is impaired. The present invention comprises nozzle members, telescopically arranged, and forming parts extensible in accordance with the width of the cloth whereby the effective length of these members is automatically adjustable with the width of the fabric. The device consists of two pipes (4), blowing air through heating (6) and a distributing manifold (7) (see also Fig. 2). The nozzle member (9) bears on both sides extensions (10-10') which move together with the guide rails (1) of the tentering frame. By tentering a fabric of a small width the extensions will move nearer to the center from both sides and the blowing space will be narrowed. In the case of fabrics having a larger width, the rails move apart and take the extensions with them whereby the drying space is moved accordingly.

Reference: A tenter frame in which hot air blowing fans or nozzles are placed on one wall while the opposite wall can be moved according to the width of the fabric has been described in Austrian Patent 149,789 (Schlenk and Linke). The purpose of this frame is to save heat in the drying operation.

Tenter Frame—



PAUL WENGRAF

Oat Preparations for Printing Thickeners D, 1

Brit. P. 578,802
(Musher Foundation, July 12, 1946)

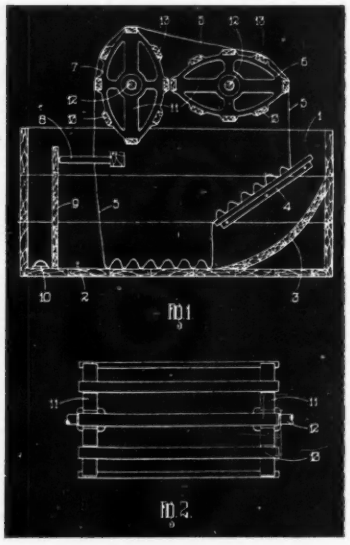
Usual thickeners for printing purposes are dextrines, gums, starches and the like. It has been found that in contrast to other cereals a particular *fraction of oats* can be used for the same purpose. A method has been developed consisting of first milling the grains in order to remove the cellulose hulls and to leave the groats for further manipulation. The groats are ground thereupon to such an extent that at least 50% but preferably 80-90% will pass through a screen, having 60-90 holes per linear inch. A coarse residue (thus 10-20%) is left over, being the stabilizing agent in the thickening composition. It has a protein content in excess of 20% and a smaller starch content than the regular non ground oats. These coarse particles are now ground separately in a stone mill. They can be used for preparing high viscous thickeners for prinsing pastes although the principal use residues in the manufacture of food, cakes and the like. The standard textbook *"Handbuch des Zeugdrucks"* (pages 135-140 and 401) enumerates obviously completely the varieties of starch, used in textile processing but does not mention the use of oats-starch at all.

Dyeing and Washing Device, Reducing Tension C, 6

Brit. P. 579,258
(Fearnleys Dyers Lim., H. Whitehead, July 29, 1946)

Conveying of wet textile materials has to be carried out in different processes

Dyeing and Washing Device—



(dyeing, bleaching, scouring). The apparatus, described in the present patent has the purpose to avoid undue tensile stress to which the textile goods are subjected during their conveyance. Two or more closely spaced members having an elliptic cross section are provided. They are rotated, as shown in the accompanying drawing, in the same direction. It is known to convey wet fabrics over single winches, having generally a circular cross section. In these arrangements an undesirable drag on the wet fabrics is caused. By the apparatus protected by this patent the fabric is given a lifting movement, by one of the winches (6) and laid on the next one (7) so that it is subjected to little tensile strain. The vat has a flat botom (2) and an inclined front face (3). An inclined plate (4) is arranged at the front to receive the fabric, to be dyed, bleached, scoured, etc. (8) is a guide through which the textile material is transported. The members (6) and (7) are clockwise driven at the same speed.

Flameproofing With Antimony Compounds G, 2, 03

Brit. P. 579,328
(Jordan-O'Neill, July 31, 1946)

Textile fibers can be rendered fire resistant by a treatment with antimony compounds. It is quite generally known to use antimony salts for this purpose but

the present invention comprises an impregnation persisting after prolonged weathering. The textiles are impregnated with a solution of potassium antimoniate, preferably pyroantimoniate and after-treated with a salt of a strong acid and a weak base. There are two possibilities: (1). to precipitate a complex antimony—and ferric oxide by giving a second impregnation with ferrous sulfate and precitpitating the compound with sodium carbonate: $Sb_2O_3 + Fe_2O_3$ gives a good flameproofing effect but the iron content causes after smouldering. (2). A not so good fire resistance is obtained by using potassium antimoniate alone, precipitated by ammonium sulfate. This impregnation however has the advantage to prevent smouldering in contradistinction to (1).

References: Pyroantimoniates have been proposed in U. S. Pat. 2,401,755 (Stein, Hall) for insolubilizing starch in printing processes. The inventors recommended already in their Brit. P. 573,471 and 573,472, issued Nov. 22, 1945 (see AMERICAN DYESTUFF REPORTER, 1946, p. 377) to disperse antimony trioxide in an aqueous casein solution by a chlorine free dispersing agent or solvent.

Printing Acetate of Cellulose With Acid Dyes — D, 2, 06

Brit. P. 579,718

(British Celanese, Aug. 13, 1946)

Printing of acetate cellulose is somewhat limited because of gas fading of some dyestuff groups, also because of low sublimation points of other dyestuff groups which are volatilized in aging processes. Printing with vat dyes requires strongly alkaline pastes which are not favorable for the acetate cellulose fiber. Acid dyestuffs might be desirable because of their brilliant shades but up to now fixing of these dyes on acetate was poor. The inventor found however that a swelling process of the fiber increased its affinity for acid dyestuffs. The printing paste contains as the principal swelling agent sodium or another *inorganic thiocyanate* and a solution of an acid dyestuff (example Xylene Milling Blue GL) in alcohol and acetic acid. The prints are aged at 110° C, washed and soaped. They offer an unusual resistance to light and acid fading.

References: Resins, incorporated within fibers are known to increase the affinity for acid dyestuffs: this phenomenon has been used according to Brit. P. 455,602 (Aceta). Resins are incorporated in cellulose acetate in order to improve the affinity of the fibers for acid dyestuffs. The assignee of this patent obtained some years ago Brit. P. 466,803, stating that watersoluble dyestuffs in general, such as Xylene Blue AS, can be used for printing acetate of cellulose by adding to the paste swelling agents such as ethyl lactate or by overprinting the prints with a swelling agent, thus obtaining two-shaded effects, because the overprinted areas show a darker color.

Crease Resistant Finishes—Polysulfones as curing agents — G, T, 04

U. S. Pat. 2,410,395 (Sylvania Industrial Corp.—Smith—Oct. 29, 1946)

The purpose of this invention is to produce acid curing resins, preferably urea-formaldehyde condensates, containing a "latent" catalyst or an accelerator, i.e., a compound being stable at room temperature and developing acid which promotes curing at higher temperatures. The composition having these desired properties is, according to the present patent, a polysulfone, liberating an acidic substance at an elevated temperature. Such polysulfones are formed by reacting sulfur dioxide (or sulfur compounds like sulfones, sulfur chlorides or the like) with mono-olefines such as butene, with di-olefines, mixed olefines, etc. One of the products quoted in the specification is a butene-sulfur dioxide polymer, prepared according to an article in *Ind. and Eng. Chemistry*, 1938, (I. E.) page 176 (Snow and Frey). An example says that a pre-condensate of urea and formaldehyde condensed at a pH = 9 and brought down to a pH = 8 with formic acid is suitable for crease resistant finishes, when an aqueous emulsion of butene-sulfur dioxide, emulsified in Turkey Red Oil, is added. The proportion was 1 p. of the sulfur compound to 100 of the resin precondensate. Cloth padded with this solution and cured at 150° C. proved to be particularly creaseproof.

Shrinkproofing (Stabilizing) Rayon Fabrics — G, 2, 04

U. S. Pat. 2,409,894 (Cluett, Peabody & Co., Pfeffer—Tweed—Jarmak, October 22, 1946)

Stabilizing of fabrics by mechanical means has been protected by the same company (see U. S. Pat. 1,861,424, issued May 31, 1942). This patent covers the so-called "Sanforizing process," named after its inventor Sanford L. Cluett. It comprises principally a method, according to which the tentered fabric (W) is re-moistened and conducted to the proper "Sanforizing" device; an endless flexible band (F) about a quarter of an inch thick, passes over a convex surface (roll R') and thereupon over the larger drum (D). At point (N) a compressive effect is obtained in the mix by the reversal of curvature from the dilated (convex) state of the band (F) to the compressed (concave) state. The moistened and therefore plastic fabric can thus be pre-shrunk in the desired dimensions. Blocks (1) ensure the web distributed along the entire width to be firmly attached to the band (F). The extent of contraction is connected with the radius of roll (R) and with the thickness of the band (F). This well know process has very good results in shrinkproofing cotton fabrics while, as the present patent says, the results with spun rayon material were not always satisfactory. The invention discloses that special spun rayon containing fabrics have been worked out being suitable for the "Sanforizing" process too. They consist of spun rayon fillings while the warp is made from spun rayon, blended with cotton. The warp yarn must contain at least 40% of cotton but *not more than 60%* in order to retain the appearance and character of an all-spun-rayon-fabric. In an example the warp consists of 30/1 blended yarns, each composed of 50% viscose staple rayon while the filling is made from pure 30/1 spun rayon yarn of 1.5 denier. The fabric has first to be finished as usual and then mechanically stabilized in the Sanforizing device.

(Concluded on Page 283)

Shrinkproofing (Stabilizing)

ABSTRACTS FROM CONTEMPORARY JOURNALS

Some Aspects of the Dyeing and Finishing of Fibro, with Special Reference to Spun-Dyed Fibro

H. A. Thomas, Journal of the Society of Dyers and Colourists, page 309, Vol. 62, No. 10, October, 1946.

Fibro refers to Courtauld's production of viscose rayon staple.

By selecting suitable pigments, spun-dyed Fibro (dyed in the mass) of excellent fastness to light and other agents can be achieved. For most shades the price of spun-dyed Fibro is but a few pence more per pound than bleached Fibro.

The dyeing of Fibro staple will not be completely superseded by the supply of Spun-dyed Fibro as it is evident that there would be commercial difficulties in supplying a sufficiently wide range of shades in a sufficiently wide range of different deniers and length of staple. There are possibilities of blending with a comparatively few spun-dyed shades. There are also possibilities in blending flock produced from various shades of spun-dyed Fibro. Spun-dyed Fibro can be considered as a new fiber and a new medium of expression for the textile designer. This development will reveal many gaps which will have to be filled by the raw stock dyer. As far as yarn dyers are concerned there will also be many gaps to be filled even when spun-dyed Fibro is utilized, particularly in mixtures of spun-dyed Fibro with white yarns. There is a very wide field to be explored by the designer working in close collaboration with the piece dyer and finisher. Fabrics woven in a variety of designs from spun-dyed Fibro yarns in conjunction with other yarns, or from various blend yarns containing different percentages of spun-dyed Fibro can be piece dyed to modify or develop the design.

In order to obtain a serviceable fabric from Fibro suitable dyeing and finishing machinery to enable the fabric to be run with a minimum of tension must be employed. Fibro is susceptible to stretching and fibro yarns have been overstretched in sizing and weaving and Fibro fabrics have been similarly maltreated in dyeing and finishing. The necessary shrinkage that should be given a fabric in order to obtain the best result must be determined individually for each pattern. Shrinkage control should begin in the sizing and weaving stages. Resins can be successfully applied to Fibro to impart crease resisting qualities. Avoidance of tension during preparatory and dyeing processes is of the utmost importance if the fabric is to be crease-resisted for, besides imparting a recovery for creasing, the resin assists in stabilizing the fabrics. High speed wooden bowl mangles, fast jigs without tension control and drying cans should be avoided.

The Dyeing of Wool with Chrome Dyes. Part II—The Chroming of Wool

P. W. Carlene, F. M. Rowe and J. B. Speakman, Journal of the Society of Dyers and Colourists, page 329, Vol. 62, No. 11, November, 1946.

This paper carries the following summary:

The titration curve of wool with chromic acid at 0° C. has been determined, a low temperature being chosen so as to minimize the rate of reduction of the chromic acid by the wool. Some reduction does occur, even at 0° C. in absence of light, and the amount of combined chromic acid was determined by extracting the wool with a pH 8 buffer solution. Since the second dissociation constant of chromic acid is very small (pK_2=6.4), it tends to behave as a monobasic acid in reaction with wool, but at low pH values the acid appears to behave as a weak monobasic acid. Instead of the acid-combining capacity reaching a limit of about 160 cc. N-acid per 100 g. dry wool, the titration curve shows an inflection at a combining capacity of 200 cc. N-acid and pH 2. Below this pH value, the combining capacity increases rapidly with change of pH, just as in the case of concentrated solutions of weak acids like monochloroacetic acid. The most interesting feature of the titration curve is, however, that it lies far to the right of the hydrochloric acid curve on the pH scale, indicating that the anions of chromic acid have a marked affinity for wool.

With this information as basis, attention was turned to the reaction between wool and boiling solutions of potassium dichromate. The latter ionizes in solution to give K^+ and $HCrO^-_4$ ions, and since the $HCrO^-_4$ ion has a marked affinity for wool, chromium is rapidly absorbed when wool is immersed in a solution of potassium dichromate. Combination between the basic side-chains of wool and the $HCrO^-_4$ ions involves the combination of a corresponding number of hydrogen ions with the acid side-chains. In consequence, the pH value of the solution in contact with the wool rises, and disulfide bond attack is likely to be severe at boiling point. Through such attack, reducing side-chains are formed in the fibers, with liberation of hydrogen sulfide, and the chromium in both the fibers and the bath is rapidly reduced from the hexavalent to the trivalent state. The course of combination and reduction of the chromium was followed by determining the total amount of chromium absorbed by the wool, and the promotions of hexavalent and trivalent chromium in the residual chroming baths and on the fibers, after various times of chroming with three concentrations of potassium dichromate.

Besides disulfide bond hydrolysis, reduction of chromate ions may be brought about by direct attack on the disulfide bond, with formation of, say, the disulfoxide, and on side-chains, such as that of tyrosine. If disulfide bond hydrolysis plays the more important part, the rate of reduction of chromate ions should be minimized by mordanting wool with potassium dichromate in presence of ammonium sulfate, because the rise in pH of the bath during chroming is therefore minimized. This expectation was found to be justified, but the possibility of direct attack on disulfide bonds could not be excluded. If such attack does occur, its extent should be minimized by mordanting wool with potassium dichromate in presence of ammonium formate, oxalate or tartrate, i.e., the salts of readily oxidizable acids, hydrolytic attack being also minimized by the use of ammonium salts. Although the ammonium salts of readily oxidizable acids may prevent direct oxidation of disulfide bonds, it was found, from determinations of the sulfur contents of wools mordanted under various conditions, that the loss of sulfur in presence of ammonium sulfate and ammonium oxalate was only a little less than with potassium dichromate alone; and the loss in presence of ammonium tartrate was the same as in its absence.

In an attempt to discover whether ammonium salts do have a significant protective effect on wool fibers during mordanting with potassium dichromate, the elastic properties of fibers chromed under various conditions were examined. The results were, however, inconclusive. Within the limits of the experimental error of the load-extension curves, there was no difference between fibers chromed in presence and absence of ammonium salts.

The nature of the wool-chromium complex was then examined by studying the elastic properties of chromed fibers before and after removal of chromium. Chromium was removed by extracting the fibers with pH 1 oxalic acid, and the results

indicated that the chromium deposited in the fibers does increase their resistance to extension in water, thus masking part of the damage brought about during mordanting. Although the supercontraction of chromed fibers was less than that of untreated fibers in boiling 5% sodium metabisulfite solution, the supercontraction of chromed fibers, after all the chromium had been removed with oxalic acid, was the same as that of unextracted chromed fibers. There is thus no evidence that chromium-containing cross-linkages are formed between the peptide chains of wool during mordanting. Without further evidence, it must be concluded that the effect of chromium compounds in increasing resistance to extension of mordanted wool is due simply to their mechanical interference with the unfolding of the main peptide chains.

The Cellulose-Dyestuff Complex. Part III—The Effect of Orientation on the Reflection of Polarized Light

J. M. Preston and P. C. Tsien, Journal of the Society of Dyers and Colourists, page 368, Vol. 62, No. 12, December, 1946.

Fiber anisotropy and the resultant dichroism of dyed fibers are shown to affect the relation between dye concentration and the intensities of reflection of polarized and unpolarized light. Fiber shape and structure are also shown to influence the reflection of light from dyed fibers.

Fungicidal Activity of Bisphenols as Mildew Preventives on Cotton Fabric

Paul B. Marsh and Mary L. Butler, Industrial and Engineering Chemistry, page 701, Vol. 38, No. 7, July, 1946.

This paper reports biological tests on an experimental series of bispenols and related materials of commercial origin. Results showed that substitution of two chlorine or two bromine atoms for hydrogen in the positions para to the phenolic hydroxyls invariably increased fungicidal potency over that observed with unhalogenated diphenols; further symmetrical halogen substitution resulted in compounds which were quite generally less potent than the dihalogen derivatives. 2,2′-methylenebis (4-chlorophenol) was probably superior in activity to any of the other compounds tested. 2,2′-methylenebis (4-nitrophenol) was completely lacking in measurable fungicidal activity, the same was also true of chlorine-substituted derivatives of 2,2′-methylenediphenol in which both phenolic hydroxyls had been blocked by formations of ether linkages. Three- and four-ring compounds containing *p*-cresol or *p*-chlorophenol units joined by —CH_2—were distinctly less effective than the corresponding bisphenols. Methods for testing are discussed.

Cotton Wax: Properties and Constituents

W. H. Tonn, Jr. and E. P. Schoch, Industrial and Engineering Chemistry, page 413, Vol. 38, No. 4, April, 1946.

Cotton wax is medium high melting, compared to other vegetable waxes. It differs from most commercial waxes in that it is not predominantly an ester, but contains smaller amounts of fatty acids and larger amounts of free alcohol as shown by high acetyl value and percentage saponifiables. The wax blends well with other natural waxes and resins and has been formulated into pastes and emulsion polishes, lubricants, leather dressings, waterproof preparations, crayons, paints, paper auxiliaries, adhesives, etc., individually and as blends with other waxes.

Patent Digest—

(Concluded from Page 281)

Synthetic Protein Fibers—Dyeing uniformly with wool C. 4, 06

U. S. Pat. 2,412,125-26 (Collins and Aikman Corp.—Conrad—Dec. 3, 1946)

Casein fibers, as well as other man made protein fibers, for instance soy bean—or zein fibers have a greater affinity to acid dyes than natural animal fibers. Yarns blended from wool and casein fibers for instance do not give even results in any one-bath-dyeing-operation. This is a great disadvantage particularly in dyeing pile fabrics containing such blended fabrics where every slight irregularity in the appearance of the yarns shows up very strikingly. The inventor observed that a decrease in affinity of the casein fibers was obtained by depositing on their surface stanneous tannate (in a two-bath-process, using first a 0.25% tannic acid solution at 100° C. and subsequently a 3% bath of stanneous chloride both figures calculated form the fiber's weight). Quite uniform results in dyeing the pile fabrics were obtained in a padding process.

Reference is made to a series of articles, discussing dyeing of "Aralac" fibers in *Textile Colorist* 1943, pp. 151, 198, 245, 294. It is stated (page 296) that one of the difficulties encountered in producing uniform shades on wool blended casein fibers with acid dyes is caused by the much faster adsorption of Aralac for this dyestuff category. No mention is, however, made of heavy metal tannates in dyeing this kind of blends. Tannin antimoniate is only used in *basic dyeing* casein fibers quite in the same way as for cotton fibers. The adverse effect disclosed here, consisting of retarding the absorption of acid dyes is therefore quite surprising. In the older literature only one reference (Brit. P. 461, 752) relating to a retarding action of tannic acid *in vat dyeing* processes could be found.

Discharge Printing on Acetate Cellulose D, 2, 02

U. S. Pat. 2,409,980 (Eastman Kodak Co., Jensen—Scully—McNally, Oct. 22, 1946)

It is known that cellulose acetate fabrics (generally cellulose esters) mostly do not give clean white discharge prints with sodium, potassium or zinc sulfoxylate without adding a swelling agent and a catalyst. Alkali earth sulfoxylates on the other hand tend to spread out the prints so that a discoloration on he outlines of the printed areas ("halo") occurs. Anthraquinone, being a good catalyst for the reducing process is difficultly removable and tends to oxidize in storage and to change the white of the discharge to a yellow to tan shade. Hydroquinone, being also a good catalyst, causes sometime a weakening of the fibers. The present invention solves the problem by adding *salicylic acid* or a salt thereof and also a swelling agent such as triethylene glycol, propylene glycol or calcium thiocynate to the printing paste. A fabric dyed a light brown with a composition of Eastone blue, orange and red is discharged according to one of the examples with a printing paste, containing sodium formaldehyde sulfoxylate, thiodiglycol and industrial gum as a thickener and salicylic acid. The proportion of sulfoxylate to salicylic acid is about 6:1. After aging the printed fabric for 3-6 minutes at 100° C, rinsing and soaping, a clear white discharge was obtained while only an orange-brown discharge print resulted when salicylic acid was omitted. Salicylic acid, according to the present method seems to increase the swelling effect of thiodiglycol. Up to now salicylic acid has not been used for this purpose. Additions of phenols, used as swelling agents in acetate discharges, have been described in U. S. Pat. 1,944,372.

• CLASSIFIED ADVERTISEMENTS •

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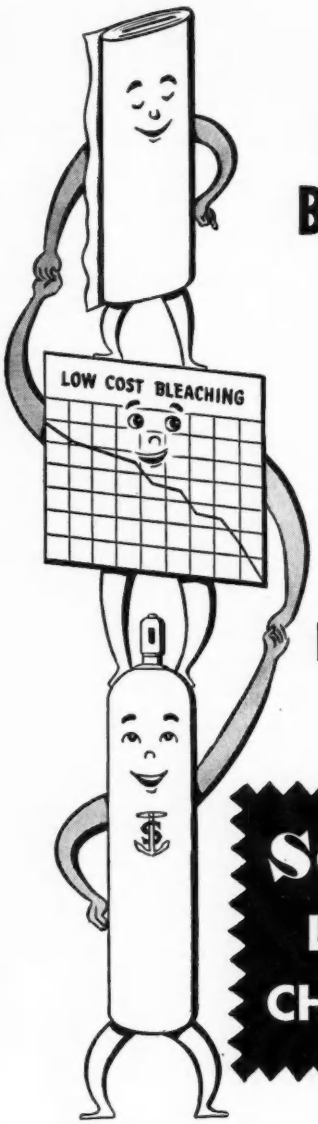

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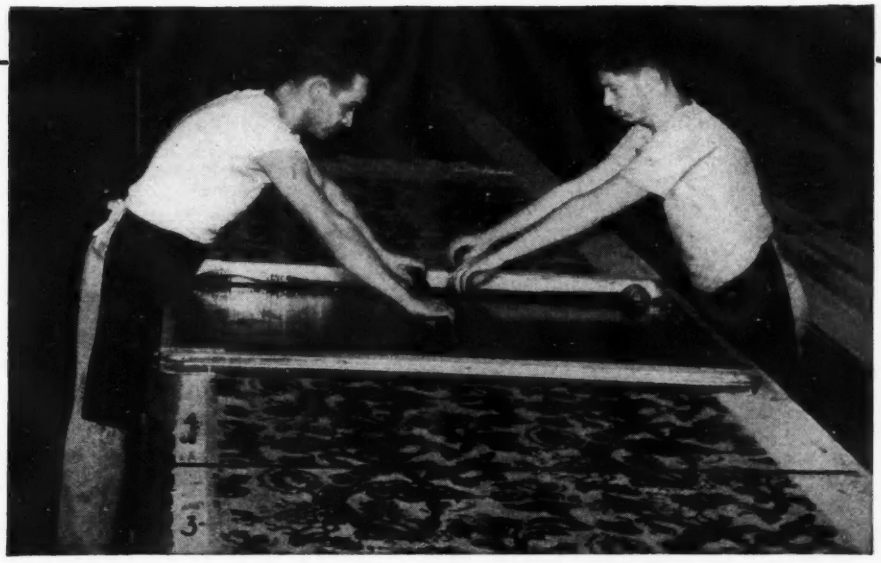

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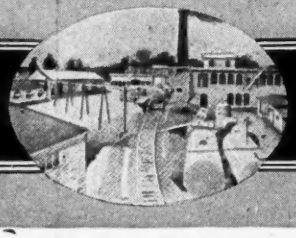

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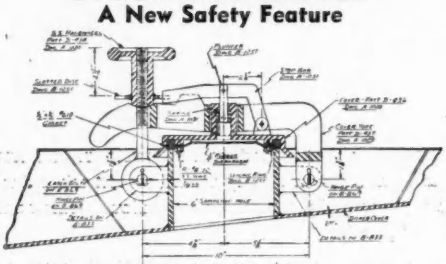

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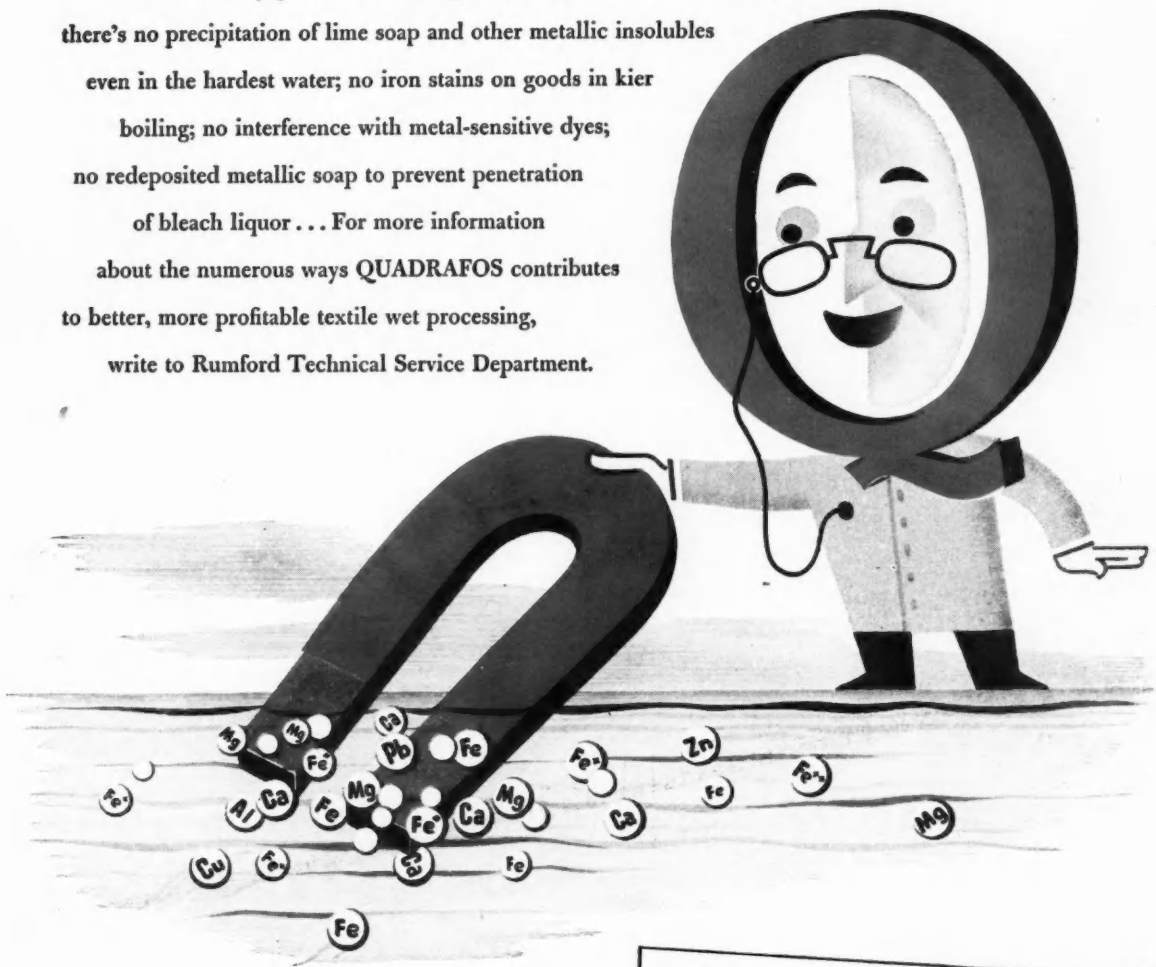

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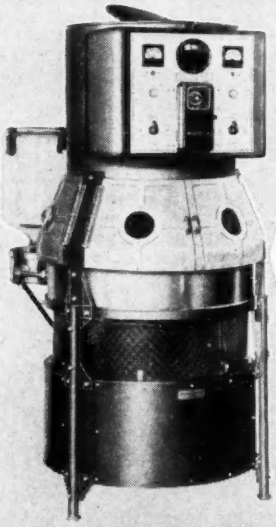

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INDEX TO ADVERTISERS

Aktivin Division, The (Heyden Chem. Corp.)	XXII
Althouse Chemical Co.	Second Cover
Amalgamated Chemical Corp.	
American Aniline Products Inc.	XXI
American Cyanamid Co. (Ind. Chem. Div.)	Back Cover
American Cyanamid Co. (Textile Resin Dept.)	XLI
American Dyewood Company	
American Key Products, Inc.	XXXIX
Arkansas Company, Inc.	III
Arnold, Hoffman & Co., Inc.	
Atlantic Chemical Co., Inc.	XXXVIII
Atlas Electric Devices Co.	XXXVI
Becco Sales Corp.	XV
Bick & Co., Inc.	XXXIX
Blickman Co., S.	
Burkart-Schier Chemical Co.	XL
Butterworth Sons, Co., H. W.	
Calco Chemical Division American Cyanamid Co.	XXIII
Calgan, Inc.	
Campbell & Co., Inc., John	VIII
Carbic Color & Chemical Co., Inc.	XXVI
Carbide & Carbon Chemicals Corp.	
Ciba Company, Inc.	
Colgate-Palmolive-Peet Co.	
Commonwealth Color & Chemical Co.	XXXVI
De Paul Chemical Co., Inc.	XXV
Drew & Co., E. F.	XVIII
Du Pont de Nemours Co., E. I. Dyestuff Division	Front Cover
Emery Industries, Inc.	
Fallek Products Co., Inc.	XXIV
Fancourt & Co., W. F.	XXXV
Geigy Company, Inc.	
General Chemical Co.	
General Dyestuff Corp.	XI
Girdler Corp., The	
Givaudan-Delawanna, Inc.	
Grinnell Co., Inc.	VI
Hardesty Co., W. C.	
Hart Products Corp.	
Heyden Chemical Corp.	
Hooker Electrochemical Co.	
Interchemical Corp., Textile Colors Div.	
International Salt Co., Inc.	
Kali Manufacturing Co.	XXXVI
Kelco Co.	XIX
Laurel Soap Mfg. Co., Inc.	XXXVII
Leatex Chemical Co.	XXXIV
Leeds & Northrup Co.	
Maher Color & Chemical Co.	IX
Marathon Corp.	V
Mathieson Alkali Works, Inc.	
Maywood Chemical Works	
Monsanto Chemical Co.	
Morrison Machine Co.	XXVIII
Myles Salt Co., Ltd.	
National Aniline Division, Allied Chmical & Dye Corp.	XIII
National Carbon Co.	
National Starch Products, Inc.	XXXI
Neuberg Co., Inc., Wm. D.	XXXVIII
Nopco Chemical Co.	
Nova Chemical Corp.	
Nuodex Products Co., Inc.	
Nyanza Color & Chemical Co., Inc.	XII
Onyx Oil & Chemical Co.	X
Oronite Chemical Co.	
Pabst Sales Company	XXX
Perkins & Sons, Inc., B. F.	
Philadelphia Quartz Co.	
Procter & Gamble	XX
Proctor & Schwartz, Inc.	
Refined Products Corp.	XVII
Richmond Oil, Soap & Chemical Co., Inc.	XXXIV, XXXIX
Riggs & Lombard, Inc.	XXXII
Rohm & Haas Co.	XLII
Royce Chemical Co.	
Rumford Chemical Works	XXXIII
Sandoz Chemical Works	
Scholler Bros., Inc.	Third Cover
Sharples Chemicals, Inc.	VII
Smith, Drum & Co.	
Socony-Vacuum Oil Co., Inc.	
Solvay Sales Corp.	XXX
Sonneborn Sons, Inc., L.	XXIX
Standard Brands, Inc.	
Standard Chemical Products, Inc.	
Standard Fabricators, Inc.	
Standard Oil Co. of N. J.	
Tennessee Eastman Corp.	
Titan Chemical Products, Inc.	XXXII
Ultra Chemical Works	
Union Carbide & Carbon Corp.	
United Chemical Prod. Co.	
Van Vlaanderen Machine Co.	XVI
Virginia Smelting Co.	XXXVII
Wallerstein Co., Inc.	IV
Warwick Chemical Co.	
Watson-Park Company	XXXII
Wolf & Co., Jacques	
Young Aniline Works	
Young Co., J. S.	
Zinsser & Co., Inc.	XXXIV

S
XXII cond Cover
XXI Back Cover XLI
XXXIX III
XXXVIII XXXVI
XV XXXIX
XL
XXIII
VIII XXVI
XXXVI
XXV XVIII
ront Cover
XXIV XXXV
XI
VI
XXXVI XIX
XXXVII XXXIV
IX V
XXVIII
XIII
XXXI XXXVIII
XII
X
XXX
XX
XVII V, XXXIX XXXII XLII
XXXIII
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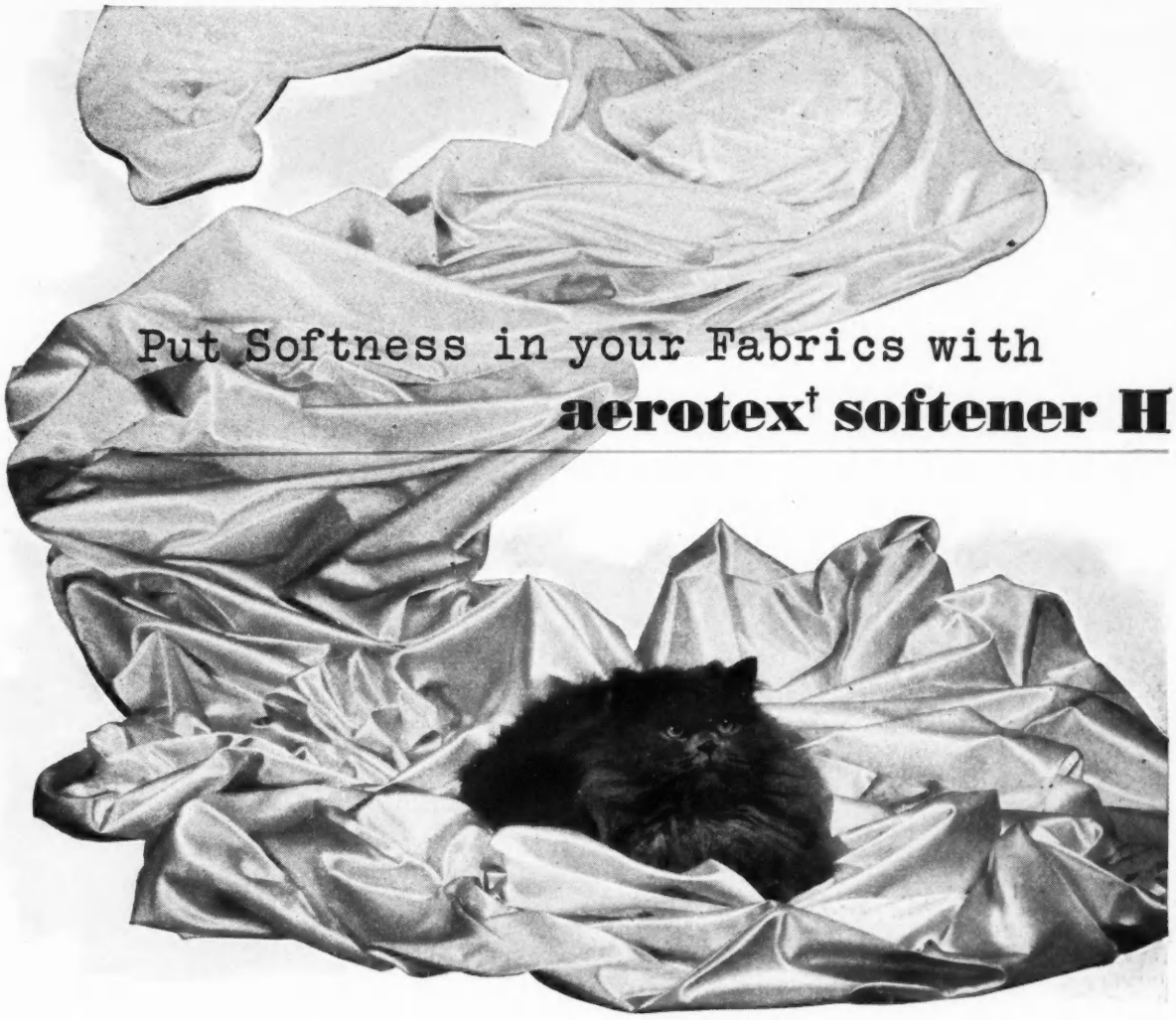
XXX XXIX
XXXII
XVI XXXVII
IV
XXXII
XXXIV
19, 1947



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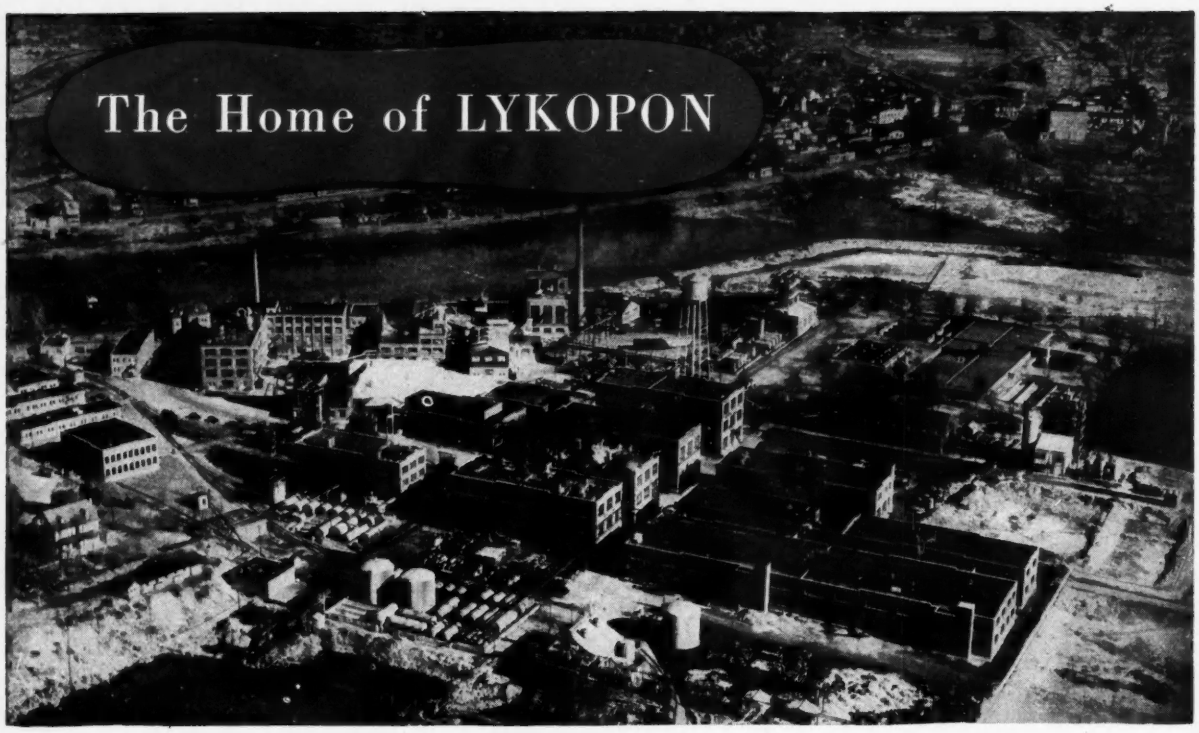

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